Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

SEP 19 1986

Re: Closure Plan Review
Facility Name: SAFETY-KLEEN-MOKENA
USEPA ID #: 000665851
1970609003

SAFETY-KLEEN CORP.
9631 W. 194th PLACE
MOKENA, IL. 60448

Dear SIR,

As you are aware, we are currently evaluating the request for closure of your facility as referenced above, and which is regulated under the Resource Conservation and Recovery Act (RCRA).

On November 8, 1984, the Hazardous and Solid Waste Amendments of 1984 (the Amendments) were enacted to amend RCRA. Under Section 206 and Section 233 (copies enclosed) of the Amendments, all facilities "seeking a permit" (taken to mean interim status facilities) must provide for corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the Unit. Please note that both hazardous and non-hazardous wastes can meet the definition of solid waste under 40 CFR 261.2.

Consequently, we must determine whether such releases have ever occurred at the facility site. If they have, we must ensure that any necessary corrective actions either have been taken, or will be taken, pursuant to a decision on your closure plan. An important part of our determination includes your willingness (or unwillingness) to complete the enclosed certification form. Please read it carefully, complete it, and either sign and return it, or return it to us unsigned with a cover letter of explanation, within 30 days of the date of this letter. Public notice of your request for closure approval, and this request, will be in a newspaper of general circulation in the area of the facility.

Please call PERMIT SECTION at 217/782-6762 if you have any questions, or wish to discuss this matter further.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:CA:tk:5/2/9

Enclosures

cc: David A. Stringham, USEPA - Region V
Permit Section
Division File

IL 532-1428
LPC 217 11/85

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

US EPA

Mary A. Gade, Director
217/524-3300

2200 Churchill Road, Springfield, IL 62794-9276

February 15, 1995

Safety-Kleen Corporation
Attn: Mr. Robert A. Schoepke
1000 N. Randall Road
Elgin, Illinois 60123-7857

Re: 1970600001 -- Will County
Safety-Kleen Corporation (Mokena)
ILD000665851
RCRA Log No. C-676
Date Received: December 29, 1994
RCRA - Permit

Dear Mr. Schoepke:

This letter is in response to the certification of closure submitted by Safety-Kleen Corporation for the hazardous waste container storage unit, a return/fill shelter (a tank unit), and two underground storage tanks at the Safety-Kleen Corporation facility in Mokena, Illinois. This certification, signed by a representative of the owner/operator, Robert A. Schoepke, and an independent registered professional engineer, Jack G. Bedessem, Jr., P.E., indicated that the subject hazardous waste management units had been closed in accordance with the plan approved by the Agency on February 11, 1993.

The subject hazardous waste management units were inspected by a representative of the Agency on January 24, 1995. The inspection revealed that the units were closed in accordance with the approved closure plan. In addition, a review of the closure certification and accompanying closure documentation report also indicates that the unit was closed in accordance with the approved closure plan. Therefore, the Agency has determined that closure of the above-referenced units at the above-referenced facility has apparently met the requirements of 35 IAC 725.

As a result of completing closure of the subject hazardous waste management units the Agency has withdrawn your Part A application.

Safety-Kleen Corporation is hereby relieved from 35 Ill Adm Code 725 Subpart H Financial Requirements at this site, which apparently consisted of financial assurance under the Safety-Kleen Corporation Corporate Financial Test for $92,800 for closure and $24,400 for post-closure financial assurance. Safety-Kleen Corporation's last corporate anniversary was December 31, 1994. The next updated financial instruments

will be due March 31, 1995 and should incorporate this change at that time. It must be noted that Safety-Kleen Corporation must maintain liability coverage for its other facilities in Illinois still subject to 35 IAC Part 725.

Should you have any questions regarding this matter, please contact Michael A. Heaton at 217/524-3312.

Sincerely,

Harry A. Chappel, P.E.
Hazardous Waste Branch Manager
Permit Section, Bureau of Land

HAC:mah
SKM

cc: USEPA Region V -- George Hamper
Jack Bedessem Jr., P.E. -- TriHydro Corporation
(Laramie, WY)

C-676

cc: Maywood
USEPA

DWC
RAH

November 11, 1992

Mr. Lawrence Eastep
Illinois Environmental Protection Agency
Permit Section
Division of Land Pollution Control
2200 Churchill Road
Springfield, IL 62794-9276

Dear Mr. Eastep:

Enclosed are three copies of the facility closure plan for the Safety-Kleen Corp. Service Center in Mokena, Illinois. The closure plan was prepared in accordance with RCRA interim status regulations listed in 35 IAC Part 725 Subparts G and J and regulations listed in 35 IAC Part 731.

The format of the closure plan is similar to the plans prepared for the Safety-Kleen Corp. Arlington Heights and Schaumburg facilities. The closure plans for these facilities have been approved and both facilities are presently implementing closure activities.

Should you have any questions or comments, please contact me at (708) 697-8460 or Jack Bedessem of TriHydro Corporation at (307) 745-7474.

Sincerely,
SAFETY-KLEEN CORP.

Robert A. Schoepke KMK
Robert A. Schoepke
Senior Project Manager - Remediation

KMK:ahj/599

cc: TriHydro Corporation

777 BIG TIMBER ROAD ELGIN, ILLINOIS 60123 PHONE 708/697-8460 FAX 708/697-4295

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/785-8604

October 22, 1992

Safety-Kleen Corporation
Attn: Scott Davies
777 Big Timber Road
Elgin, IL 60123

Refer to: 0314890002 -- Cook County
Safety-Kleen Corporation
Closure Plan Approved: November 7, 1991
Closure Log #: C-568-M-2
ILD079749073
RCRA CLOSURE Certified No.: P 435 092 189

Dear Mr. Davies:

The subject hazardous waste management facility was inspected by a representative of this Agency on July 27, 1992. The inspection revealed that the closure activity was completed in accordance with the approved closure plan dated March 11, 1991 and modified on July 1, 1991 and November 7, 1991.

Certification that the drum storage area had been closed in accordance with the approved closure plan by the owner/operator, Safety-Kleen Corp., and an independent registered professional engineer, Phil Pucel, P.E., of Illinois was received at this Agency June 18, 1992.

The Agency has determined that the closure of the hazardous waste container storage area (S01) has apparently met the requirements of Interim Status Standards, 35 Ill. Admin. Code, Part 725 (40 CFR, Part 265).

This facility must continue to meet the requirements applicable to TSD facilities under 35 Ill. Admin. Code Part 725.

If you have any questions, please contact Donna Czech at 708/531-5900.

Sincerely,

Glenn D. Savage

Glenn D. Savage, Manager
Field Operations Section
Division of Land Pollution Control
Bureau of Land

GDS:TJM:sjd

cc: USEPA Region V, George Hamper
USEPA Region V, Kelley Moore
USEPA Region V, Jane Ratcliffe
Phil Pucel, P.E.
Tom Nissan, Trihydro Corp.

CCUSEPA 7-91

FACILITY TRACKING SHEET

(Subpart H Financial Assurance Review Sheet)

Facility Name: Safety Kleen (Wilsonville) USEPA ID #: ILD000665857 IEPA ID #: 1970600001

LDF: _____ Non-LDF: ✓ Reviewer: AAV (Initials) 4-3-91 (Date) 5-8-91 7-2-91

Facility in Compliance with Subpart H 7-2-91 (Date)

Type of Instruments: LC STF Liability Coverage? Yes ___ No ___

CIL Sent 4-25-91 Response Received 5-1-91 6-17-91 PECL Sent _____ PEC Held _____

Referred to EDG _____

COMMENTS: Vio of 725-242(c)(4), 725-242(6), 724-257

Vio resolved 7-2-91

1970609003 - Will Co
Safety Kleen (Mokena)
ILD 000 665 851
Financial file

cc USEPA ✓

Illinois Environmental Protection Agency
Bureau Of Land
Record Review Report Form for Compliance Evaluations

RECEIVED
WMD RECORD CENTER
DEC 19 1994

Date of Record Review 10-11-94

Facility Name Safety Kleen (Mokena)

USEPA # ILD 000 665 851 IEPA # 1970609003

Street Address 9631 W. 194th place

City Mokena County Will

Zip Code 60448 Phone #

Contact Person Jennifer M. Jendras

Type of Facility
LDF ? Yes ___ No ✓

Regulated As:
- Transporter ___
- Treatment ___
- Storage ___
- Disposal ___
- Generator ___ (G1, G2, G3, G5)

Type of letter to be sent:
(include variable sheet)
- CIL ___
- PECL ___
- ENL ___
- In Compliance ___
- Continuing Non Comp. ___
- Update Referral ___
- None ___
- Other ___

Description of documents reviewed:

Summary of Apparent Violations

Violation	Area	Class	Violation	Area	Class
725.242 (d)					
725.244 (d)					

Include an asterisk (*) next to any continuing violations

Reviewer Andrew Wallmer Title Eng.

Date 10-11-94

You must attach Review Notes including a Narrative describing reasons or justification for any apparent violations cited.

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

IL 532-0357
ADM 39
054-002

1970609003 - W. Iroquois
Safety Kleen (Wilsonville)

Subject ILD 000665851

Data Financial File

Reviewed by Andrew Wollmer Date 10-11-94

On This date a review Was completed on the response Received on 8-29-94. The response of 8-29-94 is as a result of a CIL Which was sent on 8-10-94 as Stated in the letter of 8-29-94 the response seem adequate to resolve the violations of 725.242(b) and 725.244(b). We will see if They use the same explainants Next year to reduce the Cost.

CC: USEPA

1970609003 - Will Co
Safety Kleen (Mokena)
ILD 000 665 851
Financial F/P

FACILITY CHECKLIST

Facility Name: Safety Kleen (Mokena) Reviewed by: AAV

U.S. EPA ID #: ILD 000 665 851 1970609003 Date: 10/11/94

Facility address: 9631 W. 194th Place Mokena, IL 60448

Owner Name: Safety Kleen

Owner address: 1000 N. Randall Rd Elgin IL 60123

Estimated closure cost: $ 92,800 Date of estimate: 3/15/94

Estimated post-closure cost: $ 24,400 Date of estimate: 3/15/94

Latest annual adjustment factor: 1.02

Total estimated closure and post-closure costs: $ 117,200 Last adjusted 9/17/93

Financial Assurance Mechanisms

Date Received: 3/31/94

Mechanism	Guarantor Name & Address	Effective Date	Amount of Coverage	Validation Date	Initials
		/ /	$	/ /	
FI	Safety Kleen	3/31/94	117,200	10/11/94	AV
		/ /		/ /	
		/ /		/ /	
		/ /		/ /	
		/ /		/ /	

Total Coverage $ 117,200

Liability Coverage Mechanisms

Date Received: 9/26/94

Mechanism	Guarantor Name	Effective Date	Amount of Coverage	Validation Date	Initials
		/ /	$	/ /	
INS	Reliance National	10/1/94	8 million	10/11/94	AV
		/ /		/ /	
		/ /		/ /	
		/ /		/ /	
		/ /		/ /	

Total Coverage $ 8 million

FOLLOW-UP ACTIONS REQUIRED	DATE REQUIRED
Review cost estimates (90 days after anniversary date)	03/31/95
	/ /
	/ /

Comments: Vio of 725.214(b) & 725.244(5) Resolved

Attachments:

cc: USEPA

1970609003 - Will Co
Safety Kleen (Manteno)
ILD 000 665 851
Financial file

LIABILITY CHECKLIST/INSURANCE

Insurer: Reliance National Indemnity Reviewed By: DAV

Address: 72 Water ST. Newyork NY 10005 Date: 9/30/94

Insurer qualifications: ( ) Best's ( ) other:

Documentation: ( ) Liability endorsement (✓) Certificate of insurance ( ) Valid wording & Signatures

Policy number: NGA 0105085-02 Received Dated 9/26/94 Effective date: 10/1/94

Insured owner or operator: Safety Kleen

FACILITIES COVERED BY LIABILITY INSURANCE

Facility EPA ID#	Coverage Per Occurrence		Coverage Per Year		Coverage required	
	Sudden	Nonsudden	Sudden	Nonsudden	Sudden	Nonsudden
ILD 000805929	$1,000,000	$3,000,000	$2,000,000	$6000.000	$4000.000	$6,000,000
ILD 981097519	"	"	"	"	"	"
ILD 005450697	"	"	"	"	"	"
ILD 980613918	"	"	"	"	"	"
ILD 000781614	"	"	"	"	"	"
ILD 000805911	"	"	"	"	"	"
ILD 000665869	"	"	"	"	"	"
ILD 000665851	"	"	"	"	"	"
ILD 093762811	"	"	"	"	"	"
ILD 079749073	"	"	"	"	"	"

Coverage required by other instruments: Sudden $ 2000,000 (Maximum $2,000,000)
Nonsudden 6,000,000 (Maximum $6,000,000)
Total $ 8,000,000

Sources of additional coverage, including self-insurance:

FOLLOW-UP ACTIONS REQUIRED

	DATE REQUIRED
Annual review	10/1/94
	/ /
	/ /

Comments:

Attachments: ( ) Hazardous Waste Facility Liability Endorsement
(✓) Hazardous Waste Facility Certificate of Liability Insurance
( ) Other

IL 532-1041
LPC 125 2/83

LIABILITY CHECKLIST/INSURANCE

Insurer: _____ Reviewed By: _____

Address: _____ Date: / /

Insurer qualifications: ( ) Best's ( ) Other: _____

Documentation: ( ) Liability endorsement ( ) Certificate of insurance ( ) Valid wording & Signatures

Policy number: _____ Dated / / Effective date: / /

Insured owner or operator: _____

FACILITIES COVERED BY LIABILITY INSURANCE

Facility EPA ID#	Coverage Per Occurrence		Coverage Per Year		Coverage required	
	Sudden	Nonsudden	Sudden	Nonsudden	Sudden	Nonsudden
ILD 981088388	$1,000,000	$3,000,000	$2,000,000	$6,000,000	$2,000,000	$6,000,000
ILD 984912188	"	"	"	"	"	"

Coverage required by other instruments: Sudden $ _____ (Maximum $2,000,000)

Nonsudden _____ (Maximum $6,000,000)

Total $ _____

Sources of additional coverage, including self-insurance: _____

FOLLOW-UP ACTIONS REQUIRED

	DATE REQUIRED
Annual review	/ /
	/ /
	/ /

Comments: _____

Attachments: ( ) Hazardous Waste Facility Liability Endorsement
( ) Hazardous Waste Facility Certificate of Liability Insurance
( ) Other _____

CCUSEPA 7-91

FACILITY CHECKLIST

Facility Name: Safety Kleen Mokena Reviewed by: aav

U.S. EPA ID #: ILD000665851 1970600001 Date: 7/3/91

Facility address: 9631 West 194th Place Mokena IL 60448

Owner Name: Safety Kleen

Owner address: 777 Big Timber Rd Mokena IL 60448

Estimated closure cost: $ 52,050 Date of estimate: 4/25/91

Estimated post-closure cost: $ -0- Date of estimate: / /

Latest annual adjustment factor: revaluated

Total estimated closure and post-closure costs: $ 52,050 Last adjusted 4/27/95

Financial Assurance Mechanisms

Date Received: 6/17/91

Mechanism	Guarantor Name & Address	Effective Date	Amount of Coverage	Validation Date	Initials
		/ /	$	/ /	
FT	Safety Kleen	4/27/91	52,050	7/2/91	a
		/ /		/ /	
		/ /		/ /	
		/ /		/ /	
		/ /		/ /	

Total Coverage $ 20,789,563

Liability Coverage Mechanisms

Date Received: 6/17/91

Mechanism	Guarantor Name	Effective Date	Amount of Coverage	Validation Date	Initials
		/ /	$	/ /	
FT	Safety Kleen	4/27/91	6mm	7/2/91	a
		/ /		/ /	
INS	National Union	10/1/90	2mm	7/2/91	a
		/ /		/ /	
		/ /		/ /	

Total Coverage $ 8mm

FOLLOW-UP ACTIONS REQUIRED	DATE REQUIRED
Review cost estimates (90 days after anniversary date)	3/31/92
	/ /
	/ /

Comments:

Attachments:

SAFETY-KLEEN

MOKENA, ILD000665851
MARCH 29, 1984

CLOSURE COST ESTIMATE

A. **TANK CLOSURE** - Open, remove contents of and clean, remove, and dispose of, backfill and regrade the site of 12,000-gallon 96" diameter x 32'0" long underground storage tank, as well as a 1,300 gallon, 60" diameter x 9' long underground sludge tank.

Phase I. - Open the tank

1.	Remove Concrete Slab & Dispose 8' x 32' x 1' thick ÷ 27 = 9.5 cy 9.5 cy x $40/cy =	$ 380
2.	Excavation (Tank 3' below grade) 12' x 32' x 3' ÷ 27 = 43 cy 2 x 4' x 27' x 4' ÷ 27 = 48 cy 91 cy 91 cy x $3/cy =	$ 273
3.	Cut Opening in Tank	$ 400
	Total - Phase I	$ 1,053

Phase II - Remove Contents and Clean

1.	Contents returned to Recycle Center	$ 0*
2.	Squeegie Clean Tank =	$ 600
	Total - Phase II	$ 600

Phase III - Remove and Dispose of the Tank

1.	Disconnect and remove appurtenant equipment 2.0 man-days at $15/hour =	$ 240
2.	Torch the tank 8 hours at $20/hour =	$ 160
3.	Remove tank	$ 250
4.	Scrap Tank & Equipment	$ 100
	Total - Phase III	$ 750

* Assumed the value of the used solvent offset the cost of removal and transportation.

Phase IV - Backfilling and Regrading

1.	Backfilling	
	a. Put back previously excavated material 91 cy at $5/cy =	$ 455
	b. Mat'l to replace tank volume 12,000 gal ÷ 7.48 gal/cf = 1,604 cf 1,604 cf ÷ 27 cf/cy = 59.4 cy 59.4 cy x $10/cy =	$ 594
2.	Regrading	$ 100
3.	Debris Disposal	$ 100
	Total Phase IV	$ 1,249

Summary of Closure Cost for the 12,000-gallon tank:

Phase I	$1,053
Phase II	600
Phase III	750
Phase IV	$1,249
Total	$3,652

B. **CLOSURE OF DRUM STORAGE AREA** - Remove and return drums to the Recycle Center, clean the drum storage area, and dispose of wash water generated.

1.	Remove and return drums to the Recycle Center	N/C**
2.	Clean the storage area - ten man-hours at $15.00/hour	$150
3	Dispose of the wash water - 50 gallons at $.50/gallon	$ 25
	Total Closure Cost	$175

C. **CLOSURE OF DUMPSTER AND RETURN/FILL SHELTER AREA** - Remove, package and dispose of sludge, clean the dumpster and return/fill shelter area, remove dumpster and shelter structure for reuse.

1.	Remove, package and dispose of sludge - 150 gallons at $.75/gallon	$113
2.	Clean dumpster and shelter area - 16 man-hours at $15.00/hour	$240
3.	Remove dumpster and shelter - 16 man-hours at $20.00/hour	$320
	Torch eight hours at $20.00/hour	$160
	Total Closure Cost	$833

** Assumed the value of the used immersion cleaner and the drums offsets the cost of removal and transportation.

D. 1,300 GALLON TANK.

Phase I. - Open the tank

1.	Remove Concrete Slab & Dispose 5' x 9' x 1' thick ÷ 27 = 1.7 cy 1.7 cy x $40/cy =	$ 68
2.	Excavation (Tank 3' below grade) 7' x 9' x 3' ÷ 27 = 7 cy 2 x 2.5' x 9' x 4' ÷ 27 = 7 cy 14 cy 14 cy x $3/cy =	$ 42
3.	Cut Opening in Tank	$ 400
	Total - Phase I	$ 510

Phase II - Remove Contents and Clean

1.	1,300-gallontank assumed containing 1,000 gallond sludge and water	
	1,000 x $0.50/gall =	$ 500
2.	Squeegie Clean Tank =	$ 500
	Total - Phase II	$ 1,000

Phase III - Remove and Dispose of the Tank

1.	Disconnect and remove appurtenant equipment 2.0 man-days at $15/hour =	$ 240
2.	Torch the tank 8 hours at $20/hour =	$ 160
3.	Remove tank	$ 250
4.	Scrap Tank & Equipment	$ 100
	Total - Phase III	$ 650

Phase IV - Backfilling and Regrading

1.	Backfilling	
	a. Put back previously excavated material 14 cy at $5/cy =	$ 60
	b. Mat'l to replace tank volume 1,300 gal ÷ 7.48 gal/cf = 174 cf 174 cf ÷ 27 cf/cy = 6.5 cy 6.5 cy x $10/cy =	$ 65
2.	Regrading	$ 100
3.	Debris Disposal	$ 100
	Total Phase IV	$ 325

Summary of Closure Cost for the 1,300-gallon tank:

Phase I	$ 510
Phase II	1,000
Phase III	650
Phase IV	$ 325
Total	$2,485

Total Cost Estimate	A.	$3,652
	B.	175
	C.	833
	D.	2,485
		$7,145

CLOSURE PLAN

A. PURPOSE

The Safety-Kleen Corp. has constructed each service center with the intent that each will be a long term facility for the distribution of Safety-Kleen products. There is no onsite disposal activity at any plant and hence there is no disposal capacity to be exhausted that will necessitate closure of a facility.

In the event that some presently unforseen circumstance(s) would result in the discontinuance of operations and permanent closure or sale of the facility, the following Closure Plan is designed to identify the steps necessary to completely close the facility at any point during its intended life, and should be used for tanks and equipment.

B. POLICY

1. This plan shall be kept at the facility updated yearly and managers shall be familiar with its contents.

2. The closure plan will be submitted to the State authority at least 180 days before expected closure begins and in accordance with the applicable State regulations.

3. Within 90 days after receiving the final volume of hazardous wastes and in accordance with this plan, Safety-Kleen Corp. will remove all the wastes from the site.

4. When closure is completed, Safety-Kleen shall submit a report from an independent registered professional engineer that the facility has been closed in accordance with the specifications of this plan.

C. CLOSURE PROCEDURES

1. UNDERGROUND TANKS AND ASSOCIATED PIPING, IF APPLICABLE

a. **OUTLINE** - To safely clean and decommission underground storage tanks:

(1) Provide access to each tank.
(2) Remove remaining material from tanks and return the materials to the Recycle Center for reclamation.
(3) Rinse, scrape and squeegee tank interiors.
(4) Disconnect and cap all appurtenant underground piping.
(5) Disconnect and decontaminate all appurtenance pumping equipment.
(6) Remove tanks and appurtenant equipment and dispose as scrap.
(7) Backfill all excavations with stable materials.
(8) Transport and dispose of all other waste material generated during the project.

b. PHASE I - OPEN THE TANK

(1) To gain access to underground tanks, carefully excavate around all lines to locate a point of access. Depending on the type of opening and the condition of the equipment, a variety of tools may be used. Care must be exercised to minimize spark generation when working on the tank.

(2) Prior to opening the tanks the personnel should have full face respiratory protection and protective clothing. Once the tanks have been opened they will be provided with positive ventilation. The tanks will then be inspected to determine the approximate quantity and physical conditions of the remaining material.

c. **PHASE II - REMOVING WASTE AND CLEANING TANK**

(1) Before removing the waste from the tank, all underground piping and appurtenant equipment will be flushed first with clean mineral spirits followed by detergent solution.

(2) The method to remove the waste material from the tanks will depend on the physical properties and quantities of that material. Prior to any person entering the tank, an effort will be made to remove as much liquid and sludge as possible.

(3) Subsequent to vacuuming the majority of the material from the tanks, it may be necessary to use a high pressure wash system using clean solvent and detergent solution to rinse residual material from the walls and bottom of the tanks. The evacuated material and the rinse solution will be returned to the Recycle Center for reclamation. The quantity of wash fluid used will be kept to a minimum in order to limit the amount of unnecessary material.

(4) Storage Tanks are considered Confined Spaces i.e. spaces open or closed having a limited means of egress in which poisonous gases or flammable vapors might accumulate or an oxygen deficiency might occur.

(5) Confined Space Entry requires special operating procedures:

(a) Tanks are to be washed, neutralized and/or purged (where flammable atmosphere is present) prior to being entered.

(b) Supply valves must be closed and "tagged" and bleeder valves left open; or supply piping should be disconnected.

(c) Pumps or motors normally activiated by automatic controls shall be operated manually to be sure they have been dis-connected. Instrument power switches should be tagged "Off".

(d) On tanks where flammable vapors may be present, all sources of ignition must be removed.

(e) All tanks must be tested for flammable vapors, toxic gases or oxygen deficiency in that order as applicable. The results of such tests should be displayed on the job site.

[1] In all tank entering situations, an Oxygen Deficiency Test shall be performed prior tank entry.

[2] Under circumstances where "hot work" (welding, burning, grinding, etc.) is to be performed in or on the vessel, a test for combustible gases shall be taken. This is referred to as a "flash test".

[3] In most circumstances, flash tests and oxygen deficiency tests will be performed by the supervisor of the area in which the work is being done.

[4] Under any conditions where there exists a possibility (no matter how remote) of toxic vapors being present in the tank to be entered, the supervisor will arrange to have the air tested.

(f) There must be a set of wristlets of a rescue harness and sufficient rope at the job site to effect a rescue. Any other rescue equipment considered necessary must also be on the job site.

(g) Workers should wear rescue harness if entering a tank with a large enough opening to easily effect a rescue. In tanks with small openings, only wristlets may be used. (However, in cases where there are agitator shafts, drums or other hazards in which the man's life-line would be entangled and the supervisor in charge feels that wearing the lifeline may entrap a man and increase the hazard, the wearing of a harness of wristlets may be eliminated.)

(h) A constant source of fresh air must be provided to insure a complete change of air every few minutes. In cases of short term entry for inspection or removal of objects, an air mask is recommended. In cases of long term entry (generally for repair) the use of an air mover should be considered.

(i) When a ladder is required to enter a tank, the ladder must be secured and not removed while anyone is in the vessel. In cases where a rigid ladder could become an obstacle, a chain ladder may be used.

(j) Adequate illumination must be provided.

[1] A flashlight or other battery operated light must also be on hand to provide illumination for safety exit in the event of an electrical power failure.

[2] In any tank used to store flammable liquids, explosion-proof lighting must be used.

(k) All electrical equipment to be used inside the tank must be in good repair and grounded.

(l) Others working in the immediate area shall be informed of the work being done; and they shall inform the watcher or supervisor immediately of any unusual occurrence which may make it necessary to evacuate the tank.

(6) The "Buddy" (Watcher of Standby Observer) System:

(a) Men working inside a confined space must be under the constant observation of a fully instructed watcher.

(b) Before anyone enters the tank, the watcher will be instructed by the personincharge of the entry that:

[1] An entry authorization must be obtained from the person in charge by anyone entering the tank.

[2] A rescue harness or wristlets must be on the job.

[3] He (the watcher) must know the location of the nearest:

[a] Telephone (with emergency numbers posted).
[b] Safety Eyewash/Shower.
[c] Fire Extinguisher.
[d] Oxygen Inhalator.

[4] For all "hot work" inside a tank, the watcher must be instructed how to shut down welding/burning equipment.

[5] As long as anyone is inside the vessel, the watcher must remain in continuous contact with the worker. HE IS NOT TO LEAVE THE JOB SITE EXCEPT TO REPORT AN EMERGENCY.

[6] UNDER NO CIRCUMSTANCES SHOULD THE WATCHER ENTER THE VESSEL. If the worker(s) in the tank becomes ill or injured, the watcher is to effect the emergency plan described in the attached Standard Operating Procedure.

[7] The watcher still DOES NOT ENTER THE TANK until help is available.

(c) After being instructed in his responsibilities, the watcher will sign an instruction form indicating his understanding.

(7) Welding and Burning Within a Tank

(a) All welding and burning equipment must be provided with a shutoff under control of the watcher; and the watcher must be shown how to shut off the equipment if it becomes necessary.

(b) Welding and burning equipment will only be taken into a tank immediately prior to its use and must be removed from the tank immediately after the job is finished.

(c) For all "hot work" inside a tank, a properly executed flame permit if needed, must be displayed at the job site.

(Standard welding and burning fety precautions will always be followed.

d. **PHASE III - REMOVE TANK**

(1) Disconnect and cap all appurtenant underground piping.

(2) Disconnect and decontaminate all appurtenant pumping equipment.

(3) The vessels shall be removed and reused by Safety-Kleen or cut up and sold as scrap.

2. **ABOVEGROUND STORAGE TANKS, IF APPLICABLE**

a. **OUTLINE** - To safely clean and decommission above ground storage tanks:

(1) Expose doorways or cut openings to provide access to each tank.

(2) Remove remaining material from the tanks and return the material to the Recycle Center for reclamation.

(3) Rinse, scrape and squeegee tank interiors.

(4) Disconnect and cap all appurtenant piping.

(5) Disconnect and cap all appurtenant pumping equipment.

(6) Remove tank and appurtenant equipment for final disposition.

(7) Transport and dispose of all other waste material generated during the closure.

b. **PHASE I**

(1) Access to the above ground tanks is obtained by removing the manway cover.

(2) See Sec. 1b. - Phase I.

c. **PHASE II**

See Sec. 1c. - Phase II

3. **DRUM STORAGE AREA**

a. The drum storage area contains drums of used immersion cleaner.

b. At closure all the drums will be removed and transported to the Recycle Center with proper packaging, labeling and manifesting, where the contents in the drums will be reclaimed and the drums will be cleaned for reuse.

c. The concrete floor and spill containment sumps will be cleaned with detergent solution.

d. All other wastes generated in the closure process will be properly disposed of.

4. WET DUMPSTER AND DOCK AREA

a. The wet dumpster and dock area returns the used mineral spirits to the storage tank.

b. Closure of the wet dumpster will be made prior to the cleaning and removal of the storage tank.

c. At closure, the sludge in the dumpster ("dumpster mud") will be cleaned out of and drummed, labeled, and manifested for proper disposal at permitted facilities.

d. The dumpster and the dock area will be thoroughly rinsed with clean mineral spirits followed by detergent solution.

e. The rinsing fluids are discharged through the appurtenant piping system into the storage tank, which will be subjected to a separate closure procedure as described earlier.

f. The cleansed dumpster and dock structure will be reused by Safety-Kleen, or scrapped.

D. FACILITY CLOSURE SCHEDULE

1. Safety-Kleen may amend the closure plan at any time during the active life of the facility. (The active life of the facility is that period during which wastes are periodically received.). Safety-Kleen shall amend the plan any time changes in operating plans or facility design affect the closure plan or whenever there is a change in the expected year of closure of the facility. The plan must be amended within 60 days of the changes.

2. Safety-Kleen shall notify the State authority at least 180 days prior to the date closure is expected to begin, except in cases where the facility's permit is terminated or if the facility is otherwise ordered by judicial decree of compliance order to cease receiving wastes or to close. The date when Safety-Kleen "expects to begin closure" should be within 30 days after the date on which Safety-Kleen expects to receive the final volume of wastes.

3. Within 90 days after receiving the final volume of hazardous wastes, or 90 days after approval of the closure plan, if that is later, Safety-Kleen shall remove from the site, all hazardous wastes in accordance with the approved closure plan. The Regional Administrator may approve a longer period if Safety-Kleen demonstrates that:

   The activities required to comply with this paragraph will, of necessity, take longer than 90 days to complete; or

   The following requirements are met:

   - The facility has the capacity to receive additional wastes;
   - There is a reasonable likelihood that a person other than Safety-Kleen will recommence operation of the site;
   - Closure of the facility would be incompatible with continued operation of the site; and Safety-Kleen has taken and will continue to take all steps to prevent threats to human health and the environment.

4. Safety-Klee shall complete closure activit in accordance with the approved closure plan and within 180 days after receiving the final volume of wastes or 180 days after approval of the closure plan, whichever is later.

5. When closure is completed, all facility equipment and structures shall have been properly disposed of, or decontaminated by removing all hazardous waste and residues.

6. When closure is completed, Safety-Kleen shall submit a certification by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

A.4.2

USEPA

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/524-3300

May 23, 1994

Safety-Kleen Corporation
Attn: Robert A Schoepke
1000 N. Randall Road
Elgin, Illinois 60131

Re: 1970600001 -- Will County
Safety-Kleen Corporation
ILD000665851
Log No. C-676-M-2
Received: February 28, 1994
RCRA Closure

Dear Mr. Schoepke:

The closure plan modification request entitled "Closure Progress Report" submitted by Safety-Kleen Corporation, prepared by Trihydro Corporation has been reviewed. Your final closure plan to close the two (2) underground storage tanks (SO2), the container storage area (SO1), and the return/fill shelter (SO2) at the above-referenced facility is hereby approved subject to the following conditions and modifications:

1. Closure activities must be completed by December 1, 1994. When closure is complete the owner or operator must submit to the Agency certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan. This certification must be received at this Agency within sixty (60) days after closure, or by February 1, 1994. These dates may be revised if Safety-Kleen Corporation finds that additional time is required to complete the prescribed closure activities and Safety-Kleen Corporation demonstrates it is attempting to complete the required closure activities in a timely manner.

   The attached closure certification form must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the closure. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity. Financial assurance must be maintained for the units approved for closure herein until the Agency approves the facility's closure certification.

   The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional

Engineering Act (par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E.

Plans and specifications, design, drawings, reports, and other documents rendered as professional engineering services, and revisions of the above must be sealed and signed by a professional engineer in accordance with par. 5119, sec. 13.1 of the Illinois Professional Engineering Act.

As part of the closure certification, to document the closure activities at your facility, please submit a Closure Documentation Report which includes:

a. The volume of waste, waste residue and contaminated soil (if any) removed. The term waste includes wastes resulting from decontamination activities.

b. Scaled drawings showing the horizontal and vertical boundaries of the extent of any soil removal effort.

c. A description of the method of waste handling and transport.

d. The waste manifest numbers.

e. Copies of the waste manifests.

f. Information documenting the results of all sampling/analysis efforts. The goal of presenting this information should be to describe, in a logical manner, the activities and results associated with the sampling/analysis effort. At a minimum, this information must include:

    1. identification of the reason for the sampling/analysis effort and the goals of the effort;

    2. a summary in tabular form of all analytical data, including all quality assurance/quality control data;

    3. a scaled drawing showing the horizontal location from which all soil samples were collected;

    4. identification of the depth and vertical interval from which each sample was collected;

    5. a description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;

    6. identification of the test method used and detection limits achieved, including sample preparation, sample dilution (if necessary) and analytical inferences;

    7. copies of the final laboratory report sheets, including final sheets reporting all quality assurance/quality assurance dates;

8. visual classification of each soil sample in accordance with ASTM D-2488; and

9. a summary of all procedures used for quality assurance/quality control, including the results of these procedures;

10. a discussion of the data, as it related to the overall goal of the sampling/analysis effort.

g. A chronological summary of closure activities and the cost involved.

h. Color photo documentation of closure. Document conditions before, during and after closure.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency
Bureau of Land -- #33
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

2. If the Agency determines that implementation of this closure plan fails to satisfy the requirements of 35 Ill. Adm. Code 725.211, the Agency reserves the right to amend the closure plan. Revisions of closure plans are subject to the appeal provisions of Section 40 of the Illinois Environmental Protection Act.

3. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site plus a minimum of three days of actual field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.

4. The interior surfaces of the steel tanks and associated ancillory equipment as well as the concrete base of the container storage area surfaces shall be visually inspected, photographed and any residue adhering to the surface must be removed by scraping and/or brushing. Following this, the concrete/steel surfaces must be steam cleaned and triple rinsed. All wash and rinse water shall be collected. If the wash or rinse water samples exhibit a characteristic of hazardous waste then that material must be managed as a hazardous waste. Note that the subject submittal indicates that these areas have been decontaminated.

After cleaning the concrete/steel surfaces, an independent registered professional engineer shall inspect the integrity of the steel surfaces as it related to the ability of these surfaces to contain liquid. This surface shall be inspected for cracks which penetrate through the concrete. In addition, all construction joints must be inspected to ensure they are watertight. This inspection should be carried out in accordance with standards and recommendations of professional/technical entities such as the American Concrete Institute, the Portland Cement Association, the American Society for Testing and Materials, the American Society of Civil Engineers, etc. as they relate to the ability of concrete/asphalt surfaces to contain liquids. The results of this inspection shall be: (1) documented in the form of a report, and (2) certified by an independent Illinois registered professional engineer in accordance with 35 Ill. Adm. Code 702.106. A copy of this report must be submitted along with the closure documentation report required by Condition 2 above. The report must include:

a. The results of the inspection;

b. Scaled drawings showing the location of all cracks and construction joints observed during the inspection;

c. Conclusions reached regarding the potential for hazardous wastes and/or hazardous constituents to migrate through any cracks or construction joints observed in the areas of concern;

d. Justification for the conclusions reached (e.g., information must be provided which indicates that any construction joints in the area of concern are indeed watertight); and

e. Photographs to support the conclusions reached.

5. If joints or other defects are found in the base of the storage areas during the inspection required by Condition 4 above which would potentially allow hazardous waste or hazardous constituents to migrate through them, then soil samples must be collected from beneath them to determine if hazardous waste or hazardous constituents have been released to the underlying soil.

   a. Samples must be collected from at least one location along each joint/crack. The location from which samples are collected along each crack must be biased to any area where there is staining or any low-lying area along the joint/crack.

   b. Samples must be collected once every 10′ along each individual crack;

   c. Samples must be collected from 0"-6" and from 18"-24" below the backfill/natural soil interface at each location;

   d. The procedures used to collect and analyze all samples shall be carried out in accordance with the procedures approved in this letter.

6. All soil samples required to be collected in accordance with Condition 5 above and the approved closure plan modification request shall be analyzed for:

   a. Volatile organic compounds using Method 8240 in SW-846, for constituents above the clean-up objectives listed in Condition 7;

   b. mineral spirits using method 8015 of SW-846;

   c. Semi-Volatile Organic Compounds using Method 8270 in SW-846, for constituents above the listed clean-up objectives in Condition 7.

7. To ensure the clean-closure requirements of 35 Ill. Adm. Code IAC 725.211 and 725.214 are met, all soil which remains beneath and around the units undergoing closure must meet the following clean-up objectives (CUOs):

Constituent	Objective (mg/kg)
Acetone	0.7
Benzene	0.025
Bis(2-ethylhexyl)phthalate	0.27
Cadmium (TCLP)*	0.05
Chlorobenzene	0.5
Chromium (TCLP)	1.0
1,2-Dichlorobenzene	1.5
1,3-Dichlorobenzene	ND
1,4-dichlorobenzene	.375
1,1-Dichloroethane	3.5
1,1-Dichlorethene	0.035
Cis-1,2-Dichloroethylene	0.2
trans-1,2-Dichlorethylene	0.5
Ethylbenzene	1.0
Lead (TCLP)*	0.1
Methylnaphthalene	ND
Napthalene	.039
Mineral Spirits	50
Tetrachloroethylene	0.025
Toluene	2.5
1,1,1-Trichloroethane	1.0
Trichloroethylene	0.025
Vinyl Chloride	0.01
Xylene	10

NOTES

ND: Not Determined. Insufficient data are available upon which to base a cleanup objective recommendation. If this chemical is still detected after all other cleanup objectives have been achieved, then the project should be returned to the Agency for further review and recommendations.

*These objectives are based upon the analysis of the extract of the TCLP test described in Method 1311 of SW-846. The units of these objectives are mg/l.

8. The Agency shall be notified in writing if contaminants not listed in Condition 7 are detected above their respective practical quantitation limit. This notification shall identify the additional constituents detected and the concentration at which they were detected. The Agency will review this information and establish cleanup objectives for the newly detected contaminants, if necessary. The sampling and analysis effort being carried out to determine the extent of contamination shall not be delayed while the Agency is reviewing this information.

9. If soil is encountered during the sampling/analysis efforts required by Conditions 5 and 6 above which contains contaminants above the CUOs established in Condition 7 above, then additional soil samples must be collected, as necessary to determine the horizontal and vertical extent of soil which exceed these CUOs. The procedures used to collect and analyze these samples must be in accordance with those approved in this letter. The procedures used to determine the horizontal and vertical locations from which soil samples are to be collected in accordance with Sections 13.a and 13.b of the Agency's RCRA closure plan instructions (revised December 1990). However, no random sampling shall be used in making this determination.

10. All soil samples shall be analyzed individually (i.e., no compositing). Sampling and analytical procedures shall be conducted in accordance with Test Methods for Evaluating Solid Wastes, Third Edition (SW-846) and Attachment 7 to this Agency's closure plan instruction package. When a SW-846 (Third Edition) analytical method is specified, all the chemicals listed in the Quantitation Limits Table for that method shall be reported unless specifically exempted in writing by the Agency. When visually discolored or contaminated material exists within an area to be sampled, horizontal placement of sampling locations shall be adjusted to include such visually discolored and/or contaminated areas. Sample size per interval shall be minimized to prevent dilution of any contamination.

    Apparent visually contaminated material within a sampling interval shall be included in the sample portion of the interval to be analyzed.

11. Collection, handling, preservation, preparation and analysis of all required soil samples shall be carried out in accordance with the procedures set forth in this letter and SW-846. In addition, quality assurance/quality control procedures meeting the requirements set forth in SW-846 must be carried out during all aspects of the required soil sampling/analysis effort.

12. In addition to scraping steam cleaning and triple rinsing the concrete pads, all equipment and devices involved in the closure shall be steam cleaned and triple rinsed.

13. Contaminated soil may be excavated and disposed off-site at any time during closure. The goal of any such effort should be to remove all soil which exceeds the established cleanup objectives.

14. If soil excavation is the chosen remedial action for any soil contamination encountered, then soil samples must be collected for analysis from the bottom and sidewalls of the final excavation from which contaminated soil was removed. This sampling and analysis effort must be (1) sufficient to demonstrate that the remaining soil meets the established cleanup objectives and (2) carried out in accordance with the following procedures:

    a. A grid system as set forth in Section 13.b of the Agency's closure plan instructions should be established over the excavation.

    b. Samples should be collected from the floor of the excavation at each grid intersection, including intersections along the perimeter of the excavation.

    c. Samples should be collected 6"-12" from the top of the excavation wall at each grid intersection around the excavation perimeter. Samples should also be collected at the midpoint of the excavation wall at each grid intersection along the excavation perimeter.

    d. Collection/analysis of all required samples must be in accordance with the procedures approved in this letter.

    e. Soil samples which must be analyzed for volatile organic compounds shall be collected using Attachment 7 of the Agency's RCRA closure plan instructions. In addition, such samples must be collected 6"-12" beneath the floor/sidewalls of the excavation to minimize the possibility of volatilization of the contaminants prior to the collection of the samples.

    f. No random sampling shall be conducted to verify that the cleanup objectives have been met.

15. If soil excavation is the chosen remedial action for any soil contamination encountered, then additional soil must be removed, as necessary, until it can be demonstrated that the remaining soil in and around the area of concern meets the established cleanup objectives. Additional samples must be collected and analyzed in accordance with Condition 14 above from areas where additional soil has been removed.

16. If a decision is made that soil excavation and off-site disposal is not the preferred remedial action for this closure, then the Agency must be notified in writing when such a determination is made.

17. If groundwater is encountered during any soil removal or sampling activities prior to reaching soil which meets the cleanup objectives, the plan to investigate for potential groundwater contamination must be submitted to the Agency for review and approval. Such a plan must be submitted within sixty (60) days after the date that the analytical results are received which indicate that soil contamination extends to the water table. In addition, the Agency shall be notified in writing of this discovery within five (5) days after these analytical results are received.

18. If clean closure cannot be achieved pursuant to 35 Ill. Adm. Code 725.211 and 725.214, then a modified closure plan and a post-closure plan prepared pursuant to 35 Ill. Adm. Code Section 725, Subpart G must be submitted to the Agency for review and approval within 60 days of such a determination.

19. To avoid creating another regulated storage unit during closure, it is recommended that you obtain any necessary permits for waste disposal prior to initiating excavation activities. If it is necessary to store excavated hazardous waste on-site prior to off-site disposal, do so only in containers or tanks for less than ninety (90) days. Do not create regulated waste pile units by storing the excavated hazardous waste in piles. The ninety (90) day accumulation time exemption (35 Ill. Adm. Code 722.134) only applies to containers and tanks.

20. Please be advised that the requirements of the Responsible Property Transfer Act (Public Act 85-1228) may apply to your facility due to the management of RCRA hazardous waste. In addition, please be advised that if you store or treat on-site generated hazardous waste in containers or tanks pursuant to 35 Ill. Adm. Code 722.134, those units are subject to the closure requirements identified in 35 Ill. Adm. Code 722.134(a)(1).

21. All hazardous wastes that result from this project are subject to annual reporting as required in 35 Ill. Adm. Code 722.141 and shall be reported to the Agency by March 1 of the following year for wastes treated and left on-site or shipped off-site for storage, treatment and/or disposal during any calendar year. Additional information and appropriate report forms may be obtained from the Agency by contacting:

    Facility Reporting Unit
    Division of Land Pollution Control
    Illinois Environmental Protection Agency
    P.O. Box 19276
    Springfield, Illinois 62794-9276

22. The attached form entitled RCRA Interim Status Closure and Post Closure Care Plan General Form (LPC-PA18) must be completed and accompany all information submitted to the Agency associated with the closure activities described in this letter. As noted on this form, two copies must accompany the original of all submittals, so that the information submitted can be distributed, as necessary, to Agency personnel, Agency regional offices and/or USEPA.

Should you have any questions regarding this matter, please contact William T. Sinnott, II at 217/524-3300.

Sincerely,

Douglas W. Clay, P.E.
Hazardous Waste Branch Manager
Permit Section, Bureau of Land

DWC:WTS:sad/0295W,1-9sp
JKM

Attachment: Closure Certification Statement
Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities
General RCRA Closure Form

cc: USEPA Region V -- George Hamper

USEPA

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director
217/524-3300

2200 Churchill Road, Springfield, IL 62794-9276

March 15, 1993

Mr. Scott Davies
Safety Kleen
777 Big Timber Road
Elgin, Illinois 60123

Re: 1970600001 -- Will County
Safety Kleen/Mokena
ILD000665851
Log No. 676-M-1
RCRA-Closure

Dear Mr. Davies:

This is in response to the March 5, 1993 letter from Ms. Barbara Magel, Karaganis & White, sent on behalf of Safety-Kleen Corp. regarding certain items of the Agency's February 11, 1993 closure plan approval letter for the above-referenced facility (Log No. C-676). This submittal was handled as a closure plan modification request, due to the fact that it requested that certain items in the Agency's February 11, 1993 closure plan approval letter be modified. The requested modifications were reviewed and determined to be acceptable. As such Conditions 3, 8, 9, 15, 17, 19 and 25 below have been modified to reflect Ms. Magel's request. Please note that all of the conditions below were renumbered to accommodate the modifications requested, however, they are basically in the same order as they were in the February 11, 1993 letter.

Your final closure plan for the two (2) underground storage tanks (SO2), the container storage area (SO1), and the return fill shelter (SO2) at the above-referenced facility is hereby approved subject to the following conditions and modifications:

1. This letter supersedes the Agency's letter of February 11, 1993 (Log No. C-676);

2. Except as modified in this letter and Ms. Magel's letter of March 5, 1993, closure activities must be carried out in accordance with the report entitled Facility Closure Plan, Safety-Kleen Corp. Branch Service Center, Mokena, Illinois, prepared by TriHydro Corporation which was received by the Agency on November 16, 1992.

3. Safety-Kleen Corp. shall notify the Agency in writing of its intent to initiate closure within sixty (60) days prior to the final receipt of hazardous waste at the Mokena facility. Safety-Kleen shall then complete closure in accordance with the schedule contained within the approved Facility Closure Plan, Safety-Kleen Corp. Branch Service Center, Mokena, Illinois. When closure is complete the owner or operator must submit to the Agency certification both by the owner or

operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan. This certification must be received at this Agency within sixty (60) days after closure is completed. The schedule in the approved plan may be revised depending upon the results of the investigations required below. The schedule may also be revised if Safety-Kleen finds that additional time is necessary to complete all required closure activities and Safety Kleen demonstrates to the Agency that it is attempting to complete closure in a timely manner.

The attached closure certification form must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the closure. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity. Financial assurance must be maintained for the units approved for closure herein until the Agency approves the facility's closure certification.

The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act (par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E. Plans and specifications, designs, drawings, reports, and other documents rendered as professional engineering services, and revisions of the above must be sealed and signed by a professional engineer in accordance with par. 5119, sec. 13.1 of the Illinois Professional Engineering Act.

As part of the closure certification, to document the closure activities at the subject facility, please submit a Closure Documentation Report which contains the following information:

a. the volume of waste, waste residue and contaminated soil (if any) removed, including wastes resulting from decontamination activities. Actual disposition of this waste must also be described;

b. scaled drawings showing the horizontal and vertical boundaries from which any contaminated soil was removed;

c. a description of the method of waste handling and transport;

d. waste manifest numbers;

e. copies of the waste manifests;

f. a description of the sampling and analytical methods used including sample preservation methods and chain-of-custody

information;

g. a chronological summary of closure activities and the cost involved;

h. color photo documentation of the subject area/activities before, during and after closure; and

i. tests performed, methods and results; and

j. information documenting the results of all soil sampling/analysis efforts. The goal of presenting this information should be to describe, in a logical manner, the activities and results associated with the sampling/analysis effort. At a minimum, this information must include:

1. identification of the reason for the sampling/analysis effort and the goals of the effort;

2. a summary in tabular form of all analytical data, including all quality assurance/quality control data;

3. a scaled drawing showing the horizontal location from which all soil samples were collected;

4. Identification of the depth and vertical interval from which each sample was collected.

5. a description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;

6. identification of the test method used and detection limits achieved, including sample preparation, sample dilution (if necessary) and analytical inferences;

7. copies of the final laboratory report sheets, including final sheets reporting quality assurance/quality control data.

8. visual classification of each soil sample in accordance with ASTM D-2488; and

9. a summary of all procedures used for quality assurance and quality control; including the results of these procedures.

10. a discussion of the data, as it relates to the overall goal of the sampling/analysis effort.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency
Division of Land Pollution Control -- #33

Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

4. If the Agency determines that implementation of this closure plan fails to satisfy the requirements of 35 IAC 725.211, the Agency reserves the right to amend the closure plan. Revisions of the closure plan are subject to the provisions of Section 40 of the Illinois Environmental Protection Act.

5. If contamination is detected, the Agency must be notified in writing within fifteen (15) days. A revised closure plan addressing remediation of the contamination detected must be submitted within timeframes established by the Agency.

6. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site plus a minimum of three days of actual field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.

7. An independent registered professional engineer shall inspect the integrity of the concrete base of the container storage area and any related nearby sewer inlets, construction joints, and secondary containment structures or drainage pathways within the subject closure areas or extending from the subject closure areas. This inspection should be carried out in accordance with standards and recommendations of professional/technical entities such as the American Concrete Institute, the Portland Cement Association, the American Society for Testing and Materials, the American Society of Civil Engineers, etc. as they relate to the ability of concrete structures to contain liquids.

   A report documenting the results of this inspection must be included in the closure certification report required by Condition 3 above. This report must include the following information:

   a. the results of the inspection;

   b. scaled drawings showing the location of all cracks and construction joints observed during the inspection;

   c. conclusions reached from the inspection regarding the potential for hazardous wastes and/or constituents to migrate through any cracks or construction joints observed in the areas of concern; and

d. justification for the conclusions reached from the inspection (e.g., information must be provided which indicates that any construction joints in the areas of concern are indeed watertight).

8. The concrete base of the container storage area and of the return/fill shelter shall be visually inspected, photographed and any residue adhering to the surface must be removed by scraping and/or brushing. Following this, the concrete surfaces must be steam cleaned and triple rinsed. All wash and rinse waters must be properly contained to avoid the possibility of contaminating nearby areas to the subject closure area. All wash and rinse water shall be collected and managed as characteristically hazardous waste.

9. The tanks and their associated piping and equipment, including the pumps and solvent dumpsters, must be completely emptied of their contents. Once these units are emptied, each must be steam cleaned and triple rinsed. All wash and rinse water shall be collected and managed as described above in Condition 8 above.

10. The locations of the soil samples collected prior to the removal of the underground tanks shall be modified as follows:

    1. All soil borings shall be performed as close to the tank as possible, but no more than five (5) feet from the edge of the tank.

    2. One (1) boring shall be performed on the north, south, east, and west sides of the 12,000 gallon product and spent mineral spirit tanks. The boring performed on the north end of the 12,000 gallon product and spent mineral spirit tanks shall be performed west of the 1,300 gallon spent mineral spirit tank.

11. All equipment/devices involved in the closure of the storage area shall be steamed cleaned and tripled rinsed.

12. Cloths, personal protection clothing, etc. used during closure activities shall be disposed of as a special waste.

13. During the decontamination of the hazardous waste management units, structural containment must be provided for the wash and rinse liquids. A description of such containment structures must be provided within the report required in Condition 3 of this letter.

    If any absorbing material used for containment during decontamination activities becomes soaked and the wash/rinse water is found to be hazardous waste, then the material must be analyzed to determine if it exhibits any characteristic of hazardous waste. Such material must then be managed as a hazardous waste or a non-hazardous special waste.

14. If joints, cracks or other defects are found in the base of the storage areas during the inspection required by

Condition 9 above which would potentially allow hazardous waste or hazardous constituents to migrate through them, then soil samples must be collected from beneath them to determine if hazardous waste or hazardous constituents have been released to the underlying soil. This sampling/analysis effort shall be carried out in accordance to the below listed procedures.

a. Samples must be collected from at least one location along each joint or crack that provides a potential for hazardous waste or hazardous constituents to migrate to underlying soil. Such locations shall be biased to stained areas or low-lying areas where spills would tend to accumulate.

b. The procedures used to collect and analyze all samples shall be carried out in accordance with the procedures approved by this letter.

c. Samples shall be collected from 0"-6" and from 18"-24" below the subgrade/natural soil interface.

15. Each soil sample which must be collected for analysis shall be analyzed for:

a. volatile organic compounds using Method 8240 in Test Methods for Evaluating Solid Wastes, Third Edition, including Final Update 1 (SW-846). The Practical Quantitation Limits (PQLs) set forth in Table 1 of Method 8240 must be achieved in these analyses;

b. mineral spirits using Method 8015 of SW-846;

c. cadmium, chromium, and lead using the TCLP test described in Method 1311 of SW-846; and

e. semi-volatile organic compounds using Method 8270 in SW-846. All constituents in Table 2 of Method 8270 must be analyzed for and the PQLs listed in Table 2 must be achieved.

16. All required soil samples shall be analyzed individually (i.e., no compositing). Sampling and analytical procedures shall be conducted in accordance with SW-846 and Attachment 7 to this Agency's closure plan instruction package. When a SW-846 analytical method is specified, all chemicals listed in the Quantitation Limits Table for that method shall be reported unless specifically exempted in writing by the Agency.

When visually discolored or contaminated materials exists within an area to be sampled, horizontal placement of sampling locations shall be adjusted to include such visually discolored and/or contaminated areas. Sample size per interval shall be minimized to prevent dilution of any contamination. Apparent visually contaminated material within a sampling interval shall be included in the sample portion of the interval to be analyzed. To demonstrate a parameter is not present in a sample, analysis results must show a

detection limit at least as low as the PQL for that parameter in the third edition of SW-846. For inorganic parameters, the detection limits must be at least as low as the RCRA Groundwater Detection Limits, as referenced in SW-846 (Third Edition), Volume 1A, pages TWO-29 and TWO-30, Table 2-15.

17. Safety Kleen must conduct a soil sampling/analysis effort to determine the horizontal and vertical extent of soil around the underground tanks and, if applicable, the container storage area which contains contaminants in concentrations higher than those set forth in the following table:

Contaminant	Soil Concentration
Acetone	0.7 mg/kg
Benzene	0.005 mg/kg
Cadmium (TCLP)*	0.005 mg/l
Chlorobenzene	0.1 mg/l
Chromium (TCLP)*	0.1 mg/l
p-Cresol	0.66 mg/kg
1,1-Dichloroethane	0.7 mg/kg
1,2-Dichloroethane	0.005 mg/kg
1,1-Dichloroethylene	0.007 mg/kg
cis-1,2-Dichloroethylene	0.07 mg/kg
trans-1,2-Dichloroethylene	0.1 mg/kg
Ethylbenzene	0.7 mg/kg
Lead (TCLP)*	0.05 mg/l
Methylene Chloride	0.005 mg/kg
Mineral Spirits	50.0 mg/kg
Tetrachloroethylene	0.005 mg/kg
Toluene	1.0 mg/kg
1,1,1-Trichloroethane	0.2 mg/kg
Trichloroethylene	0.005 mg/kg
Vinyl Chloride	0.01 mg/kg
Xylenes	10.0 mg/kg

* value is based on the analysis of the extract of the TCLP test (Method 1311 in SW-846).

18. The following procedures must be utilized in the collection of the soil samples required by Condition 16 above:

    a. A sufficient number of samples should be collected and analyzed to clearly determine the horizontal and vertical limits of the soil which contains contaminants in concentrations above the values set forth in Condition 14 above. The procedures used to determine the vertical location of these additional samples should meet the requirements of Sections 13.a and 13.b of the Agency's RCRA closure plan instructions (revised December 1990). The procedures used to collect and analyze these samples must be in accordance with those approved by this letter. However, no random sampling shall be conducted as part of this investigation.

    b. The procedures used to collect the soil samples must

be sufficient so that all soil encountered is classified in accordance with ASTM Method D-2488.

c. If a drill rig or similar piece of equipment is necessary to collect required soil samples, then:

1. the procedures specified in ASTM Method D-1586 (Split Spoon Sampling) or D-1587 (Shelby Tube Sampling) must be used in collecting the samples.

2. Soil samples must be collected continuously at several locations to provide information regarding the shallow geology of the area where the investigation is being conducted;

d. Soil samples not collected explicitly for VOC analysis should be field-screened for the presence of VOCs;

e. All soil samples which will be analyzed for volatile organic compounds must be collected in accordance with Attachment 7 of the Agency's RCRA closure plan instructions;

19. A report documenting the results of the soil sampling/analysis effort required by Condition 18 must be submitted to the Agency by December 31, 1993. This report must contain the following information:

a. A discussion of (1) the reason for the sampling/analysis effort and (2) the goals of the sampling analysis effort;

b. A scaled drawing showing the horizontal and vertical location where all soil samples were collected;

c. Identification of the depth and vertical interval over which each soil sample was collected;

c. Justification for the locations from which soil samples were collected;

d. A description of the procedures used for:

1. Sample collection;

2. Sample preservation;

3. Chain of custody;

4. Decontamination of sampling equipment;

e. Visual classification of each soil sample collected for analysis;

f. A discussion of the results of the field screening effort;

g. A description of the soil types encountered during the investigation, including scaled cross-sections;

h. A description of the procedures used to analyze the soil samples, including:

1. The analytical procedure used, including the procedures, if any, used to prepare the sample for analysis;

2. Any dilutions made to the original sample;

3. Any interferences encountered during the analysis of each sample;

4. The practical quantitation limit achieved, including justification for reporting PQLs which are above those set forth in SW-846.

i. A description of all quality control/quality assurance analyses conducted, including the analysis of lab blanks, trip blanks and field blanks (for water samples only);

j. A description of all quality assurance/quality control efforts made overall;

k. A summary of all analytical data, including QA/QC results, in tabular form;

l. Copies of the final laboratory sheets which report the results of the analyses, including final sheets reporting quality assurance/quality control data;

m. Colored photographs documenting the sampling effort;

n. A discussion of the data. This discussion should include a description of the amount of contamination present in the area. This description must focus on both the horizontal and vertical extent of contamination and the distribution of the contamination within the area.

o. Scaled drawings showing the horizontal and vertical boundaries of the soil which contains contaminants at concentrations higher than those set forth in Condition 14 above, and the distribution of the contaminant concentration within this area.

20. Along with the report required by Condition 19 above, Safety-Kleen must submit, if it desires, proposed soil clean-up objectives. Detailed information must be provided to support any clean-up objectives proposed by Safety Kleen. If no such information is provided then, the Agency will establish clean-up objectives based upon the protection of Class 1 groundwater. If Safety-Kleen desires to have alternate objectives which it feels will meet the closure performance

standards of 35 IAC 725.211, 725.214 and 725.297(a), then Safety Kleen must submit the information identified in Guidance on the Required Information for Site-Specific Cleanup Objectives. At a minimum, if Safety Kleen desires to have clean-up objectives based upon the protection of Class 2 groundwater, rather than the protection of Class 1 groundwater, then Safety Kleen must submit the information Guidance for Establishing the Basis for Cleanup Objectives. Copies of these documents are enclosed.

21. The Agency shall be notified in writing if at any time contaminants not listed in Condition 17 are detected above their respective practical quantitation limits. This notification shall identify the additional constituents detected and the concentration at which they were detected. The Agency will review this information and establish cleanup objectives for the newly detected contaminants, if necessary. The sampling analysis effort being carried out to determine the extent of contamination shall not be delayed while the Agency is reviewing this information.

22. To avoid creating another regulated storage unit during closure, it is recommended that you obtain any necessary permits for waste disposal prior to initiating excavation activities. If it is necessary to store excavated hazardous waste on-site prior to off-site disposal, do so only in containers or tanks for less than ninety (90) days. Do not create regulated waste pile units by storing the excavate hazardous waste in piles. The ninety (90) day accumulation time exemption (35 IAC 722.134) only applies to containers and tanks.

23. All contaminated soil which is excavated for off-site disposal must be managed in accordance with 35 IAC 722, 723, 728, and 809, as well as all applicable federal requirements.

24. If Safety-Kleen determines that soil excavation and off-site disposal is not the preferred remedial action for any contaminated soil encountered during the required closure activities, then the Agency must be notified in writing when such a determination is made. At that time, the Agency will provide Safety-Kleen with additional guidance regarding the information which must be submitted to the Agency for review and approval relative to the alternative remedial action which the facility would like to implement.

25. The Agency must be notified in writing if, at any time, it is found that soil contamination extends to the water table. This notification must be made within 15 days after such a discovery is made. A plan to investigate for potential groundwater contamination must be submitted to the Agency for review and approval within 60 days after the initial written notification is submitted to the Agency.

26. Please be advised that the requirements of the Responsible Property Transfer Act (Public Act 85-1228) may apply to your facility due to the management of RCRA hazardous waste. In addition, please be advised that if you store or treat on-site

generated hazardous waste in containers or tanks pursuant to 35 IAC 722.134, those units are subject to the closure requirements identified in 35 IAC 722.134(a)(1).

27. All hazardous wastes that result from this project are subject to annual reporting as required in 35 IAC 722.141 and shall be reported to the Agency by March 1 of the following year for wastes treated and left on-site or shipped off-site for storage, treatment and/or disposal during any calendar year. Additional information and appropriate report forms may be obtained from the Agency by contacting:

    Facility Reporting Unit
    Division of Land Pollution Control
    Illinois Environmental Protection Agency
    P.O. Box 19276
    Springfield, Illinois 62794-9276

28. Along with your certification of closure, please submit a request to withdraw the RCRA Part A application initially submitted for this facility.

29. All references to the "Agency's RCRA closure plan instructions" refer to the document entitled Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities, December 11, 1990.

30. The quality assurance/quality control procedures set forth in SW-846 must be followed in all soil sampling/analysis efforts.

Should you have any questions regarding this matter, please contact Ron Harmon or Jim Moore at 217/524-3268.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control
Bureau of Land

LWE:JKM:jm:f6

Attachments: Closure Certification Statement
Guidance on the Required Information for Site-Specific Soil Cleanup Objectives
Guidance for Establishing the Basis for Cleanup Objectives
Guidance for Developing a Risk Assessment for Site-Specific Soil Cleanup Level Proposal for RCRA Clean Closures

NOTE: ALL ATTACHMENTS WERE PREVIOUSLY TRANSMITTED WITH C-676 AND ARE NOT ATTACHED TO THIS DOCUMENT

cc: USEPA Region V -- George Hamper

Closure Certification Statement
Closure Log C-676-M-1

This statement is to be completed by both the responsible officer and by the registered professional engineer upon completion of closure. Submit one copy of the certification with original signatures and three additional copies.

The hazardous waste container storage area (SO1), the two (2) underground storage tanks (SO2), and the return fill shelter (SO2) at the facility described in this document have been closed in accordance with the specifications in the approved closure plan. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

USEPA ID Number	Facility Name
Owner/Operator Signature Date	Name and Title
Registered P.E. Signature Date	Name of Registered P.E. and Illinois Registration Number
Registered P.E.'s Mailing Address:	Registered P.E.'s Seal:

JKM:jm:c:16746cl

USEPA

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/524-3300

February 11, 1993

Mr. Scott Davies
Safety Kleen
777 Big Timber Road
Elgin, Illinois 60123

Re: 1970600001 -- Cook County
Safety Kleen/Mokena
ILD000665851
Log No. 676
RCRA-Closure

Dear Mr. Davies:

The report entitled Facility Closure Plan, Safety-Kleen Corp. Branch Service Center, Mokena, Illinois, prepared by TriHydro Corporation, has been reviewed by this Agency. Your final closure plan for the two (2) underground storage tanks (SO2), the container storage area (SO1), and the return fill shelter (SO2) at the above-referenced facility is hereby approved subject to the following conditions and modifications:

1. Closure activities must be completed by August 15, 1993. When closure is complete the owner or operator must submit to the Agency certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan. This certification must be received at this Agency within sixty (60) days after closure, or by October 15, 1993. These dates may be revised depending on the results of the investigations required below. These dates may also be revised if Safety-Kleen finds that additional time is necessary to complete all required closure activities and Safety-Kleen demonstrates to the Agency that it is attempting to complete closure in a timely manner.

   The attached closure certification form must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the closure. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity. Financial assurance must be maintained for the units approved for closure herein until the Agency approves the facility's closure certification.

   The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act

(par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E. Plans and specifications, designs, drawings, reports, and other documents rendered as professional engineering services, and revisions of the above must be sealed and signed by a professional engineer in accordance with par. 5119, sec. 13.1 of the Illinois Professional Engineering Act.

As part of the closure certification, to document the closure activities at the subject facility, please submit a Closure Documentation Report which contains the following information:

a. the volume of waste, waste residue and contaminated soil (if any) removed, including wastes resulting from decontamination activities. Actual disposition of this waste must also be described;

b. scaled drawings showing the horizontal and vertical boundaries from which any contaminated soil was removed;

c. a description of the method of waste handling and transport;

d. waste manifest numbers;

e. copies of the waste manifests;

f. a description of the sampling and analytical methods used including sample preservation methods and chain-of-custody information;

g. a chronological summary of closure activities and the cost involved;

h. color photo documentation of the subject area/activities before, during and after closure; and

i. tests performed, methods and results; and

j. information documenting the results of all soil sampling/analysis efforts. The goal of presenting this information should be to describe, in a logical manner, the activities and results associated with the sampling/analysis effort. At a minimum, this information must include:

    1. identification of the reason for the sampling/analysis effort and the goals of the effort;

    2. a summary in tabular form of all analytical data, including all quality assurance/quality control data;

    3. a scaled drawing showing the horizontal location from which all soil samples were collected;

4. Identification of the depth and vertical interval from which each sample was collected.

5. a description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;

6. identification of the test method used and detection limits achieved, including sample preparation, sample dilution (if necessary) and analytical inferences;

7. copies of the final laboratory report sheets,including final sheets reporting quality asssurance/quality control data.

8. visual classification of each soil sample in accordance with ASTM D-2488; and

9. a summary of all procedures used for quality assurance and quality control; including the results of these procedures.

10. a discussion of the data, as it relates to the overall goal of the sampling/analysis effort.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency
Division of Land Pollution Control -- #33
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

2. If the Agency determines that implementation of this closure plan fails to satisfy the requirements of 35 IAC 725.211, the Agency reserves the right to amend the closure plan. Revisions of the closure plan are subject to the provisions of Section 40 of the Illinois Environmental Protection Act.

3. If contamination is detected, the Agency must be notified in writing within fifteen (15) days. A revised closure plan addressing remediation of the contamination detected must be submitted within timeframes established by the Agency.

4. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site

plus a minimum of three days of actual field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.

5. An independent registered professional engineer shall inspect the integrity of the concrete base of the container storage area and any related nearby sewer inlets, construction joints, and secondary containment structures or drainage pathways within the subject closure areas or extending from the subject closure areas. This inspection should be carried out in accordance with standards and recommendations of professional/technical entities such as the American Concrete Institute, the Portland Cement Association, the American Society for Testing and Materials, the American Society of Civil Engineers, etc. as they relate to the ability of concrete structures to contain liquids.

   A report documenting the results of this inspection must be included in the closure certification report required by Condition 1 above. This report must include the following information:

   a. the results of the inspection;

   b. scaled drawings showing the location of all cracks and construction joints observed during the inspection;

   c. conclusions reached from the inspection regarding the potential for hazardous wastes and/or constituents to migrate through any cracks or construction joints observed in the areas of concern; and

   d. justification for the conclusions reached from the inspection (e.g., information must be provided which indicates that any construction joints in the areas of concern are indeed watertight).

6. The concrete base of the container storage area shall be visually inspected, photographed and any residue adhering to the surface must be removed by scraping and/or brushing. Following this, the concrete surfaces must be steam cleaned and triple rinsed. All wash and rinse waters must be properly contained to avoid the possibility of contaminating nearby areas to the subject closure area. All wash and rinse water shall be collected. If analysis of the wash or rinse water samples detect the presence of any F001, F002, F003, F005, F006, F007, F008 constituents above the constituents PQL identified in Test Methods for Evaluating Solid Wastes, Third Edition, (SW-846), then that material must be managed as a hazardous waste. If the wash or rinse water samples exhibit a characteristic of hazardous waste then that material must be managed as a hazardous waste. At a minimum, this material must be managed as a special waste in accordance with 35 IAC 809.

7. The tanks, and their associated piping and equipment, including the pumps; solvent dumpsters; return/fill shelter floor; etc., must be steam cleaned and triple rinsed. All wash and rinse water shall be collected, analyzed, and managed as described above in Condition 6.

8. The locations of the soil samples collected prior to the removal of the underground tanks shall be modified as follows:

    1. All soil borings shall be performed as close to the tank as possible, but no more than five (5) feet from the edge of the tank.

    2. One (1) boring shall be performed on the north, south, east, and west sides of the 12,000 gallon product and spent mineral spirit tanks. The boring performed on the north end of the 12,000 gallon product and spent mineral spirit tanks shall be performed west of the 1,300 gallon spent mineral spirit tank.

9. All equipment/devices involved in the closure of the storage area shall be steamed cleaned and tripled rinsed.

10. Cloths, personal protection clothing, etc. used during closure activities shall be disposed of as a special waste.

11. During the decontamination of the hazardous waste management units, structural containment must be provided for the wash and rinse liquids. A description of such containment structures must be provided within the report required in Condition 1 of this letter.

    If any absorbing material used for containment during decontamination activities becomes soaked and the wash/rinse water is found to be hazardous waste, then the material must be analyzed to determine if it exhibits any characteristic of hazardous waste. Such material must then be managed as a hazardous waste or a non-hazardous special waste.

12. If joints, cracks or other defects are found in the base of the storage areas during the inspection required by Condition 5 above which would potentially allow hazardous waste or hazardous constituents to migrate through them, then soil samples must be collected from beneath them to determine if hazardous waste or hazardous constituents have been released to the underlying soil. This sampling/analysis effort shall be carried out in accordance to the below listed procedures.

    a. Samples must be collected from at least one location along each joint or crack that provides a potential for hazardous waste or hazardous constituents to migrate to underlying soil. Such locations shall be biased to stained areas or low-lying areas where spills would tend to accumulate.

b. The procedures used to collect and analyze all samples shall be carried out in accordance with the procedures approved by this letter.

c. Samples shall be collected from 0"-6" and from 18"-24" below the subgrade/natural soil interface.

13. Each soil sample which must be collected for analysis shall be analyzed for:

a. volatile organic compounds using Method 8240 in Test Methods for Evaluating Solid Wastes, Third Edition, including Final Update 1 (SW-846). The Practical Quantitation Limits (PQLs) set forth in Table 1 of Method 8240 must be achieved in these analyses;

b. mineral spirits using Method 8015 of SW-846;

c. cadmium, chromium, and lead using the TCLP test described in Method 1311 of SW-846; and

e. additional analytical methods must be utilized as necessary to ensure that the detection limits achieved during the analysis are equal to or below the clean-up objectives established in Condition 15 below.

14. All required soil samples shall be analyzed individually (i.e., no compositing). Sampling and analytical procedures shall be conducted in accordance with SW-846 and Attachment 7 to this Agency's closure plan instruction package. When a SW-846 analytical method is specified, all chemicals listed in the Quantitation Limits Table for that method shall be reported unless specifically exempted in writing by the Agency.

When visually discolored or contaminated materials exists within an area to be sampled, horizontal placement of sampling locations shall be adjusted to include such visually discolored and/or contaminated areas. Sample size per interval shall be minimized to prevent dilution of any contamination. Apparent visually contaminated material within a sampling interval shall be included in the sample portion of the interval to be analyzed. To demonstrate a parameter is not present in a sample, analysis results must show a detection limit at least as low as the PQL for that parameter in the third edition of SW-846. For inorganic parameters, the detection limits must be at least as low as the RCRA Groundwater Detection Limits, as referenced in SW-846 (Third Edition), Volume 1A, pages TWO-29 and TWO-30, Table 2-15.

15. Safety Kleen must conduct a soil sampling/analysis effort to determine the horizontal and vertical extent of soil around the underground tanks and,if applicable, the container storage area which contains contaminants in concentrations higher than those set forth in the following table:

Contaminant	Soil Concentration
Acetone	0.7 mg/kg
Benzene	0.005 mg/kg
Cadmium (TCLP)*	0.005 mg/l
Chlorobenzene	0.1 mg/l
Chromium (TCLP)*	0.1 mg/l
p-Cresol	0.35 mg/kg
1,1-Dichloroethane	0.7 mg/kg
1,2-Dichloroethane	0.005 mg/kg
1,1-Dichloroethylene	0.007 mg/kg
cis-1,2-Dichloroethylene	0.07 mg/kg
trans-1,2-Dichloroethylene	0.1 mg/kg
Ethylbenzene	0.7 mg/kg
Lead (TCLP)*	0.0075 mg/l
Methylene Chloride	0.0002 mg/kg
Mineral Spirits	50.0 mg/kg
Tetrachloroethylene	0.005 mg/kg
Toluene	1.0 mg/kg
1,1,1-Trichloroethane	0.2 mg/kg
Trichloroethylene	0.005 mg/kg
Vinyl Chloride	0.002 mg/kg
Xylenes	10.0 mg/kg

* value is based on the analysis of the extract of the TCLP test (Method 1311 in SW-846).

16. The following procedures must be utilized in the collection of the soil samples required by Condition 14 above:

    a. A sufficient number of samples should be collected and analyzed to clearly determine the horizontal and vertical limits of the soil which contains contaminants in concentrations above the values set forth in Condition 14 above. The procedures used to determine the vertical location of these additional samples should meet the requirements of Sections 13.a and 13.b of the Agency's RCRA closure plan instructions (revised December 1990). The procedures used to collect and analyze these samples must be in accordance with those approved by this letter. However, no random sampling shall be conducted as part of this investigation.

    b. The procedures used to collect the soil samples must be sufficient so that all soil encountered is classified in accordance with ASTM Method D-2488.

    c. If a drill rig or similar piece of equipment is necessary to collect required soil samples, then:

        1. the procedures specified in ASTM Method D-1586 (Split Spoon Sampling) or D-1587 (Shelby Tube Sampling) must be used in collecting the samples.

2. Soil samples must be collected continuously at several locations to provide information regarding the shallow geology of the area where the investigation is being conducted;

d. Soil samples not collected explicitly for VOC analysis should be field-screened for the presence of VOCs;

e. All soil samples which will be analyzed for volatile organic compounds must be collected in accordance with Attachment 7 of the Agency's RCRA closure plan instructions;

17. A report documenting the results of the soil sampling/analysis effort required by Condition 16 must be submitted to the Agency by June 1, 1993. This report must contain the following information:

a. A discussion of (1) the reason for the sampling/analysis effort and (2) the goals of the sampling analysis effort;

b. A scaled drawing showing the horizontal and vertical location where all soil samples were collected;

c. Identification of the depth and vertical interval over which each soil sample was collected;

c. Justification for the locations from which soil samples were collected;

d. A description of the procedures used for:

1. Sample collection;

2. Sample preservation;

3. Chain of custody;

4. Decontamination of sampling equipment;

e. Visual classification of each soil sample collected for analysis;

f. A discussion of the results of the field screening effort;

g. A description of the soil types encountered during the investigation, including scaled cross-sections;

h. A description of the procedures used to analyze the soil samples, including:

    1. The analytical procedure used, including the procedures, if any, used to prepare the sample for analysis;

    2. Any dilutions made to the original sample;

    3. Any interferences encountered during the analysis of each sample;

    4. The practical quantitation limit achieved, including justification for reporting PQLs which are above those set forth in SW-846.

i. A description of all quality control/quality assurance analyses conducted, including the analysis of lab blanks, trip blanks and field blanks;

j. A description of all quality assurance/quality control efforts made overall;

k. A summary of all analytical data, including QA/QC results, in tabular form;

l. Copies of the final laboratory sheets which report the results of the analyses, including final sheets reporting quality assurance/quality control data;

m. Colored photographs documenting the sampling effort;

n. A discussion of the data. This discussion should include a description of the amount of contamination present in the area. This description must focus on both the horizontal and vertical extent of contamination and the distribution of the contamination within the area.

o. Scaled drawings showing the horizontal and vertical boundaries of the soil which contains contaminants at concentrations higher than those set forth in Condition 14 above, and the distribution of the contaminant concentration within this area.

18. Along with the report required by Condition 17 above, Safety-Kleen must submit, if it desires, proposed soil clean-up objectives. Detailed information must be provided to support any clean-up objectives proposed by Safety Kleen. If no such information is provided then, the Agency will establish clean-up objectives based upon the protection of Class 1 groundwater. If Safety-Kleen desires to have alternate objectives which it feels will meet the closure performance standards of 35 IAC 725.211, 725.214 and 725.297(a), then Safety Kleen must submit the information identified in

Guidance on the Required Information for Site-Specific Cleanup Objectives. At a minimum, if Safety Kleen desires to have clean-up objectives based upon the protection of Class 2 groundwater, rather than the protection of Class 1 groundwater, then Safety Kleen must submit the information Guidance for Establishing the Basis for Cleanup Objectives. Copies of these documents are enclosed.

19. The Agency shall be notified in writing if at any time contaminants not listed in Condition 15 are detected above their respective practical quantitation limits. This notification shall identify the additional constituents detected and the concentration at which they were detected. The Agency will review this information and establish cleanup objectives for the newly detected contaminants, if necessary. The sampling analysis effort being carried out to determine the extent of contamination shall not be delayed while the Agency is reviewing this information.

20. Contaminated soil may be excavated and disposed off-site at any time during closure. The goal of any such effort should be to remove all soil which exceeds the established cleanup objectives.

21. To avoid creating another regulated storage unit during closure, it is recommended that you obtain any necessary permits for waste disposal prior to initiating excavation activities. If it is necessary to store excavated hazardous waste on-site prior to off-site disposal, do so only in containers or tanks for less than ninety (90) days. Do not create regulated waste pile units by storing the excavate hazardous waste in piles. The ninety (90) day accumulation time exemption (35 IAC 722.134) only applies to containers and tanks.

22. If soil excavation is the chosen remedial action for any solid contamination encountered, then additional soil must be removed, as necessary, until it can be demonstrated that the remaining soil in and around the area of concern meets the established cleanup objectives. Additional samples must be collected and analyzed in accordance with the conditions of this letter.

23. All contaminated soil which is excavated for off-site disposal must be managed in accordance with 35 IAC 722, 723, 728, and 809, as well as all applicable federal requirements.

24. If Safety-Kleen determines that soil excavation and off-site disposal is not the preferred remedial action for any contaminated soil encountered during the required closure activities, then the Agency must be notified in writing when such a determination is made. At that time, the Agency will provide Safety-Kleen with additional guidance regarding the information which must be submitted to the Agency for review

and approval relative to the alternative remedial action which the facility would like to implement.

25. The Agency must be notified in writing if, at any time, it is found that soil contamination extends to near the water table. This notification must be made within 15 days after such a discovery is made. A plan to investigate for potential groundwater contamination must be submitted to the Agency for review and approval within 60 days after the initial written notification is submitted to the Agency.

26. If groundwater is encountered during the soil sampling activities prior to reaching soil which meets the cleanup objectives, a plan to investigate for potential groundwater contamination must be submitted within sixty days after the date that the analytical results are received which indicate that soil contamination extends to the water table. In addition, the Agency shall be notified in writing of this discovery within five (5) days after these analytical results are received.

27. Please be advised that the requirements of the Responsible Property Transfer Act (Public Act 85-1228) may apply to your facility due to the management of RCRA hazardous waste. In addition, please be advised that if you store or treat on-site generated hazardous waste in containers or tanks pursuant to 35 IAC 722.134, those units are subject to the closure requirements identified in 35 IAC 722.134(a)(1).

28. All hazardous wastes that result from this project are subject to annual reporting as required in 35 IAC 722.141 and shall be reported to the Agency by March 1 of the following year for wastes treated and left on-site or shipped off-site for storage, treatment and/or disposal during any calendar year. Additional information and appropriate report forms may be obtained from the Agency by contacting:

    Facility Reporting Unit
    Division of Land Pollution Control
    Illinois Environmental Protection Agency
    P.O. Box 19276
    Springfield, Illinois 62794-9276

29. Along with your certification of closure, please submit a request to withdraw the RCRA Part A application initially submitted for this facility.

30. All references to the "Agency's RCRA closure plan instructions" refer to the document entitled Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities, December 11, 1990.

31. The quality assurance/quality control procedures set forth in SW-846 must be followed in all soil sampling/analysis efforts.

Should you have any questions regarding this matter, please contact Ron Harmon at 217/524-3268.

Very truly yours,

Lawrence W. Eastep, P.E. / Manager
Permit Section
Division of Land Pollution Control
Bureau of Land

LWE:RAH:rah

Attachments:
- Closure Certification Statement
- Guidance on the Required Information for Site-Specific Soil Cleanup Objectives
- Guidance for Establishing the Basis for Cleanup Objectives
- Guidance for Developing a Risk Assessment for Site-Specific Soil Cleanup Level Proposal for RCRA Clean Closures

cc: USEPA Region V -- George Hamper
TriHydro Corporation

Closure Certification Statement

Closure Log C-676

This statement is to be completed by both the responsible officer and by the registered professional engineer upon completion of closure. Submit one copy of the certification with original signatures and three additional copies.

The hazardous waste container storage area (SO1), the two (2) underground storage tanks (SO2), and the return fill shelter (SO2) at the facility described in this document have been closed in accordance with the specifications in the approved closure plan. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

USEPA ID Number	Facility Name
Owner/Operator Signature Date	Name and Title
Registered P.E. Signature Date	Name of Registered P.E. and Illinois Registration Number
Registered P.E.'s Mailing Address:	Registered P.E.'s Seal:

JKM:jm:c:16746cl

ATTACHMENT 7

Soil Volatile Sampling Procedures

Procedure:

A. PREPARATION AND DECONTAMINATION OF SOIL SAMPLER (i.e. STAINLESS STEEL, BRASS, BRONZE, COPPER, etc.). An example of these samplers would be a shelby tube, split-barrel sampler with metal tube inserts or california sampler. These are only examples. There may be more types available. Also, the sample tube **must** be at least six inches long.

*1. Wash tubing or sampler with hot water and a nonfoaming detergent.

2. Rinse with hot water.

*3. Rinse with a solvent, such as hexane or acetone.

4. Rinse with very hot water to drive off solvent.

5. Rinse with deionized distilled water.

6. Air Dry

7. Store the sampler in aluminum foil until ready for use.

* Consult the laboratory for specific recommendations.

B. SOIL SAMPLING FOR VOLATILE ORGANICS

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.

2. **DO NOT** remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.

3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.

4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.

5. Put the sample in storage at 4 degrees centigrade immediately.

6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

NOTE: Soil samples which will be tested for volatile organic constituents <u>cannot</u> be composited because of the volatilization which would result from any compositing method.

GUIDANCE ON THE REQUIRED INFORMATION FOR SITE-SPECIFIC SOIL CLEANUP OBJECTIVES

The IEPA allows facilities to propose site-specific soil cleanup objectives (CUOs) and will accept them as meeting the closure performance standards of 35 IAC 725, Subpart G if the facility submits sufficient information to the Agency demonstrating that the proposed levels will not (1) potentially result in significant contamination of any environmental media, and (2) result in a present or future threat to human health or the environment due to direct contact through dermal exposure, inhalation or ingestion.

Information pertaining to the existing conditions at the site must be gathered before a detailed risk assessment can be made which demonstrates that the proposed soil CUOs meet the objectives stated above. Therefore, the following steps should be taken in the development of site-specific soil CUOs.

1. Prior to initiating any site-specific evaluation of the risks associated with any residual contamination that will remain at the site, information must be provided to the Agency regarding the horizontal and vertical extent of soil at the site in which contamination exists at levels greater than IEPA established CUOs. This information must not only include the extent of contamination, but it must also identify the distribution of the contaminants within these boundaries. With this information in hand, a facility can begin to evaluate the overall impacts which may result from leaving certain levels of residual contamination in the soil. The information which must be provided includes:

    a. A report documenting the horizontal and vertical extent of contamination above IEPA established CUOs. This report should include results of analyses conducted to date and any other sampling/analysis effort necessary to determine the horizontal and vertical extent of contamination. This report must include:

        1. A summary of the results (including tables);

        2. A scaled drawing showing the location where all soil samples were collected, relative to the regulated unit;

        3. The depth interval where the samples were collected;

        4. A description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;

        5. Identification of the test method used and detection limits achieved;

        6. Copies of the laboratory report sheets;

        7. A discussion of the information identified above. This discussion should include a description of the amount of contamination present at the area. This description must focus on both the horizontal and vertical extent of contamination and distribution of the contamination (including actual concentration) of the contamination with these boundaries.

b. A report describing any activities conducted to date regarding any soil removal activities. The information in this report must include:

1. Scaled drawings showing the horizontal and vertical boundaries of the final excavation from which any soil was removed;

2. Sampling/analytical results which indicate the concentration of contaminants remaining in the bottom and sidewalls of the excavations;

3. Appropriate information identified in Item 1.a. above as it relates to the sampling and analysis done in connection with any soil removal activities.

2. In conjunction with the requirements of Item 1 above, information related to the geology/hydrogeology of the site must also be provided to the Agency, including an identification of the presence and use of aquifers beneath the site. Agency guidance for gathering and reporting this information, entitled, "Guidance for Establishing the Basis for Cleanup Objectives," is attached for reference.

3. Once the information required by Items 1 and 2 above is obtained, a detailed site-specific assessment must be made which conclusively demonstrates that the proposed residual soil contamination at this site does not pose a risk to human health and the environment. Guidance for conducting a site specific risk assessment can be obtained from the documents outlined in the draft Agency document entitled, "Guidance for Developing Risk Assessment for a Site-Specific Soil Cleanup Level Proposal for RCRA Clean Closures," attached for your reference. This document discusses the information which should be included in, and format of, a site specific risk assessment.

a. The efforts associated with the risk assessment include making several assumptions, some of which may or may not be entirely representative of what will actually happen. Therefore, factors of safety must also be utilized to offset these assumptions. Furthermore, factors of safety must also be utilized to further ensure that the proposed cleanup objectives will indeed be protective of human health and the environment. It must be noted that factors of safety are commonplace in engineering design where uncertainties exist and where the final design must be protective of human health. As such, results of any analytical effort must be reduced by an appropriate factor of safety to ensure the proposed soil objectives are truly protective of human health and the environment.

b. An evaluation must also be conducted on the impacts the proposed residual soil contamination will have, if any, on the groundwater beneath the facility. No proposed residual soil concentration may cause the groundwater quality beneath the facility to exceed the groundwater standards set forth in 35 IAC 620.

JM/mls/sp380Z/1-2

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director 2200 Churchill Road, Springfield, IL 62794-9276

GUIDANCE FOR ESTABLISHING THE BASIS FOR CLEANUP OBJECTIVES
(December 1992)

The Illinois Pollution Control Board finalized regulations establishing groundwater quality standards for the State of Illinois (see 35 IAC 620) in November 1991. As such, the Agency must ensure that the soil cleanup objectives which have been or will be established for each facility will not cause any future violations of these standards. In general, the Agency will establish soil and groundwater cleanup objectives which it feels are necessary to protect the quality of Class I groundwater (the most stringent standards), unless site-specific information is provided which would indicate otherwise. Therefore, if a facility desires to have less stringent cleanup objectives than those based upon the protection of Class I groundwater, a report must be developed and submitted to the Agency which (1) assesses the geology and hydrogeology of this site and (2) indicates no groundwater subject to the Class I standards will be impacted by the residual contamination in the soil. Such a determination will result in the Agency establishing cleanup objectives based upon the protection of Class II groundwater. This report should utilize, as available, existing information and contain:

1. A detailed description of the geologic and hydrogeologic characteristics of the area in which the site is located. Specifically, the geography, geology, lithology, stratigraphy and hydrogeology of the area within a 1 to 2 mile radius of the site based upon existing information must be described. In addition, the presence and location of any "Class I aquifers" (as generally defined in 35 IAC 620) must be identified and discussed. Existing information which should be relied upon includes, but is not limited to, information from the Illinois Scientific Surveys, the Agency, other State and Federal organizations, water well investigation logs and previous investigations (including subsurface investigations for building foundations). References should be provided in the report for all sources of information utilized in the report.

2. The results of a site specific investigation which included, at a minimum, one boring made near the area undergoing closure which was (1) drilled in accordance with ASTM Method D-420 and (2) sampled continuously using either a split spoon sampler (ASTM Method D-1586) or a Shelby tube sampler (ASTM Method D-1587). In addition, all soil encountered must be field classified in accordance with ASTM Method D-2488. Furthermore, appropriate testing must be conducted, as necessary, to demonstrate that the water-bearing units encountered do not possess any of the characteristics identified in 35 IAC 620.210(a)(4). This boring must extend from the ground surface to a depth which is 10' into the uppermost water-bearing unit subject to Class I standards OR bedrock, whichever is shallower. The information related to this investigation contained in the report must include:

   a. A discussion of the procedures utilized;

   b. A completed boring log;

   c. The results of all tests conducted during the investigation;

Mary A. Gade, Director
2200 Churchill Road, Springfield, IL 62794-9276

d. Identification of all unconsolidated geologic units beneath the site, to bedrock;

e. Identification of those geologic units in Item 1.d above which are water-bearing units and an indication of whether the groundwater in these units would be subject to the Class I or Class II standards set forth in 35 IAC 620;

f. A discussion of the results, including a conclusion related to the presence or absence beneath the site of groundwater subject to the Class I standards.

3. An identification of any private water supply wells within a one mile radius of the site. A scaled drawing showing the location of these wells must be provided along with actual logs and documentation of the efforts made to obtain this information;

4. An identification of any public water supply wells within a two mile radius of the site. A scaled drawing showing the location of these wells must be provided along with actual logs and documentation of the efforts made to obtain this information;

5. An identification of the geologic units beneath the site which are used for private water supply within a one mile radius of the site (including bedrock units) and an indication of whether these units contain groundwater subject to the Class I Standards;

6. An identification of the geologic units beneath the site which are used as a public water supply (including bedrock units) and an indication of whether these units contain groundwater subject to the Class I standards;

7. A discussion of the impact the residual soil contamination at the site will have on any groundwater beneath the site which is subject to the Class I standards.

The Illinois State Water Survey and the Illinois State Geological Survey should be contacted, as well as other appropriate state and federal entities, to obtain existing information related to the hydrogeology of the area. The report must contain adequate documentation that information from the surveys was used in developing this hydrogeologic assessment.

A certification meeting the requirements of 35 IAC 702.126 must accompany this report. In addition, an independent Illinois registered professional engineer must also certify the information in the report.

(December, 1992)

JM:sf/sp/458Z,1-2

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

GUIDANCE FOR DEVELOPING A RISK ASSESSMENT FOR SITE-SPECIFIC SOIL CLEANUP LEVEL PROPOSAL FOR RCRA CLEAN CLOSURES

DRAFT

Clean closure of a hazardous waste management unit requires removal of all waste, leachate, liners, soil and groundwater which are contaminated with waste or leachate that pose a present or potential threat to human health or the environment. USEPA put this requirement in simpler terms by stating that the ultimate goal of clean closure is "drinkable leachate" and "edible soil" (see 53 FR 51446, December 21, 1988). As such, all soil which remains at a site undergoing clean-closure must meet certain cleanup objectives (CUOs) which will ensure that this ultimate goal is met. The Agency generally establishes "base line" cleanup objectives for facilities utilizing very conservative assumptions, due to the large number of RCRA closures being carried out in the State of Illinois. However, a facility may propose site-specific health-based (human and environmental) levels to the Agency for review and approval which would be utilized to ensure that the soil remaining at that site would not pose a present or potential threat to human health or the environment.

The site-specific soil CUOs proposed by a facility must be such that the levels of contaminants which remain in the soil will not (1) potentially result in significant contamination of any environmental media (groundwater, soil, surface water or air), and (2) result in a present or future threat to human health or the environment due to direct contact through dermal exposure, inhalation or ingestion. These proposed levels must be based on a detailed assessment of the risks associated with leaving the proposed levels of contaminants in the soil. Guidance regarding the procedures which should be utilized in developing these proposed cleanup objectives can be found in, but not limited to, the following:

1. "Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual" (EPA /540/1-89/002, December, 1989)

2. "Risk Assessment Guidance for Superfund: Volume I - Part B, Development of Risk-Based Preliminary Remediation Goals" (Pub. 9285.7-01B, December, 1991)

3. "Human Health Evaluation Manual Supplemental Guidance: Standard Default Exposure Factors" (Pub. 9285.6-03, March, 1991)

4. "Superfund Exposure Assessment Manual" (EPA/540/1-88/001, April, 1988)

5. "Dermal Exposure Assessment: Principles and Applications: (EPA/600/8-91/011B, January, 1992)

6. "Exposure Factors Handbook" (EPA/600/8-89/043, July, 1989)

7. "Summary Report on Issues in Ecological Risk Assessments" (EPA/625/3-91/018, February, 1991)

8. "Ecological Assessment of Hazardous Waste Sites: A Field and Lab Reference" (EPA/600/3-89/013, March, 1989)

9. "Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual (Interim Final)" (EPA/540/1-89/001, March, 1989)

10. 35 Illinois Administrative Code, Part 620, Subpart F: Health Advisories

11. 35 Illinois Administrative Code, Part 724, Subpart F: Releases From Solid Waste Management Units

12. Integrated Risk Information System (IRIS)

13. Health Effects Assessment Summary Tables (HEAST)

At a minimum, these proposed cleanup objectives must be based upon an evaluation of the impacts such residual soil contamination will have on: (1) surface water contact and ingestion by humans and wildlife, (2) groundwater contact and ingestion by humans, (3) soil ingestion by humans and wildlife, (4) dermal contact by humans and wildlife, (5) inhalation of vapors by humans and wildlife and (6) the quality of local surface water and groundwater in comparison to established standards. Keep in mind that the potential point of exposure to hazardous waste constituents for clean closure must be assumed to be directly at or within the boundary of the unit for all routes of exposure (surface water contact, groundwater ingestion, inhalation and direct contact). No attenuation of the hazardous waste constituents leaching from the waste residues can be presumed to occur before the constituents reach exposure points. The use of fate and transport modeling to determine exposure levels outside the area of contamination will not be accepted. Levels of constituents in leachate may be estimated based on known characteristics of the waste constituents determined by soil leaching tests (e.g. TCLP).

A report documenting all efforts carried out as part of this assessment must be submitted to the Agency for review and approval along with the proposed cleanup objectives. This report must support the cleanup objectives being proposed and include the following:

1. A discussion of the procedures (and models) utilized for the assessment, including specific references to the source of the procedures and models used. This discussion should address the following components of each exposure scenario (i.e., dermal contact, inhalation of vapors, ingestion of soil/groundwater, etc.) developed for the risk assessment:

    a. the source of the hazard (i.e., contaminated soil, groundwater, etc.);

    b. potential target receptors (i.e., human, plant, animal, etc.) with an explanation as to why they were selected; and

c. potential exposure circumstances (i.e., occupational, residential, etc.) with a discussion on the future land use of this site. Currently, the Agency requires that a residential setting be evaluated, rather than occupational/industrial;

2. Justification for the procedures and models utilized;

3. A discussion of the strengths and weaknesses of the procedures (and models) utilized for the assessment;

4. A discussion of all assumptions made and the effects they have on the overall effort;

5. Justification, including specific references, of all assumptions used in the evaluation;

6. Appropriate reference to information obtained from textbooks, reference books, guidance documents, etc. This reference should identify the exact page(s) within the document from which the information was obtained;

7. A discussion and justification of all data utilized for the assessment. Please note that the data relating to the physical and chemical characteristics of the site (e.g., site geology and extent of contamination) must be site-specific. Approximate values for the various parameters used in the assessment, that are based upon general textbook ranges, will not be accepted.

8. A sensitivity analysis for all input parameters whose value is somewhat uncertain.

9. All documentation supporting the site-specific data utilized using the assessment. This would include, but not be limited to, the following items:

   a. a discussion of the hydrogeology at these site (i.e, depth to bedrock aquifer classification, soils classification, etc.) and the results of the geological borings;

   b. a discussion of the results of the soil analyses;

   c. copies of the analytical reports from the laboratory;

   d. the test methods used and detection limits achieved;

   e. the depth and interval of samples taken;

   f. a scaled drawing showing the location of the subject hazardous waste management unit(s) and the locations where the soil samples were obtained;

g. a description of the soil sampling procedures and sample preservation/chain of custody methods.

10. All calculations required as part of the assessment;

11. A discussion of the results. This discussion should, among other things, put into perspective the results based upon the assumptions utilized and the methods employed during the assessment. It should focus on the actual effects which may occur if the proposed level of contaminants are allowed to remain at the facility. It should also describe the uncertainties in the assessment and possibly include a range of plausible risks up to and including the risks which might be experienced by the maximally exposed individual in the present and future.

12. Certification in accordance with 35 IAC 702.126 by a registered professional engineer that all calculations made in this evaluation are correct. This certification is not meant to indicate that the methods used are correct only that the arithmetic manipulation of the data (addition, subtraction, multiplication and division) is correct.

Soil cleanup levels will depend to a great extent on the existing and potential use of groundwater and/or surface water in the area surrounding the facility. Information and documentation regarding existing and potential use of groundwater and/or surface water in the area surrounding the facility should be provided to justify a proposed site-specific, health-based cleanup level. More specifically, the owner/operator should contact the IEPA Division of Public Water Supplies (DPWS) at 217/785-8653; Illinois Department of Public Health (Springfield) at 217/782-5830; the Illinois State Water Survey (Champaign) at 217/333-8497; and the Illinois State Geological Survey (Champaign) at 217/333-4747 to gather information to determine the existing and potential type and extent of groundwater and/or surface water use in the area.

The Agency cannot guarantee that the cleanup levels derived from the risk assessments will be the final objectives approved by the Agency for this site. The Agency must be satisfied that (1) any soil contamination remaining on-site cannot cause degradation of groundwater or surface water and will not become an air pollution source; and (2) any contamination remaining in the groundwater will not pose a current or potential threat to human health and the environment.

Specific questions regarding the development of site-specific soil cleanup objectives should be directed to the Office of Chemical Safety of this Agency (Telephone No. 217/785-0830).

JM/mls/sp97Z/1-4

(February 1993)

C-676

Xtra Copy

PROJECT: 599

FACILITY CLOSURE PLAN
SAFETY-KLEEN CORP.
BRANCH SERVICE CENTER
MOKENA, ILLINOIS

November 11, 1992

Submitted to:

Illinois Environmental Protection Agency
Permit Section
Division of Land Pollution Control
2200 Churchill Road
Springfield, IL 62794-9276

TriHydro Corporation

920 Sheridan Street
Laramie, Wyoming 82070

(307) 745-7474
FAX: (307) 745-7729

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CHAPTER I

INTRODUCTION

Safety-Kleen Corp. (S-K) operates a branch service center at 9631 West 194th Place, Mokena, Illinois. The facility has been in operation since October 1977 as a service center for distribution of mineral spirits and storage of spent mineral spirits, other parts-cleaning solvents, and spent dry cleaning waste. The service center is an integral part of a distribution/recycling network and does not include disposal facilities. The principal clients of S-K are repair shops, fleet operators, dry cleaners, and industry and government facilities which use parts-cleaning solvents.

S-K plans to terminate operations and close the entire facility in July, 1993. S-K is currently planning to relocate the Mokena facility operations to the S-K recycling center in Dolton, Illinois (ILD 980613913). S-K intends to manage the Mokena service center operations under the Dolton Recycle Center TSD permit.

A 12,000-gallon spent mineral spirits underground storage tank (UST), a 1,300-gallon sludge UST, associated piping and appurtenances, return/fill station with wet dumpsters, and drum storage area will be closed under RCRA interim status regulations listed in 35 IAC Part 725 Subparts G and J. A 12,000-gallon mineral spirits product tank will also be closed. Removal of the mineral spirits product tank will be performed in accordance with 35 IAC Part 731 regulations.

Facility Identification

Name:	Safety-Kleen Corp. Branch Service Center 5-034-05
Facility Location:	9631 W. 194th Place Mokena, Illinois 60448 Will County
Facility Telephone No.:	708-479-1064
Mailing Address:	777 Big Timber Road Elgin, IL 60123

USEPA ID No.:	ILD 000665851
IEPA ID No:	1970600001
Contact for Closure:	Robert A. Schoepke Senior Project Manager - Remediation
Contact Telephone No.:	708-697-8460
Geographic Location:	Range: 12E Township: 35N Section: 9 (SE 1/4 of NE 1/4) Lat. 41-32-42N Long. 087-51-09W

Facility Description

The Mokena branch service center is located in Will County, Illinois, on 194th Place about 1-1/4 miles south of the interchange of Route 45 and I-80 (Figure 1). The area is zoned for industrial use. To the best of S-K's knowledge, no easements or title, deed, or usage restrictions exist which may be in conflict with operations or closure of the site.

The Mokena service center is located in an industrial park which consists of multi-unit buildings. Land use in the areas north, south and west of the S-K facility is primarily commercial and light industrial. A residential area is located directly east of the industrial park.

The facility is supplied with water and sanitary sewer services by the Citizens Utilities Company. The Village of Mokena obtains its drinking water from four wells located more than 1/4 mile west of the facility. The Arbury Hills housing development, directly across Route 45 from the facility, also utilizes Citizens Utilities Company services. No schools or municipalities using private wells lie within 1/4 mile of the facility. The nearest known water supply well is reported to be located more than 1/2 mile from the facility. Typical well completion records from the areas which are on file with the Illinois Geological Survey are included in Appendix A.

The site lies at an elevation of approximately 712 feet above sea level. Topography at the site is nearly flat with local drainage to the south. The nearest surface water body is Hickory Creek, located approximately one (1)

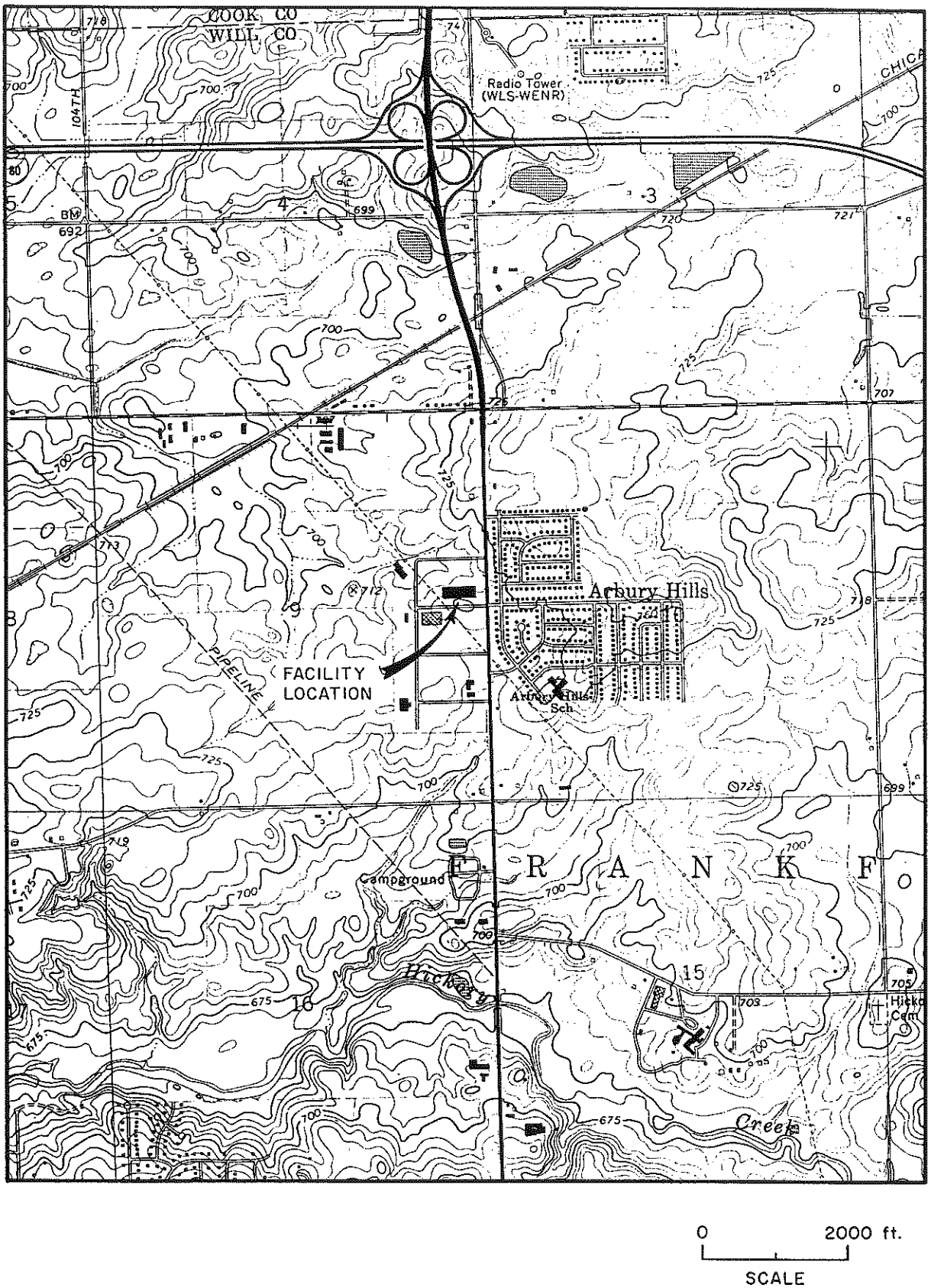


FIGURE 1 : FACILITY LOCATION, SAFETY-KLEEN CORP. SERVICE CENTER, MOKENA, ILLINOIS

mile south of the facility. The facility is not located within a 100-year floodplain.

The S-K Mokena facility is located in the Frankfort soil association. This association consists of level to moderately sloping soils consisting of relatively poorly drained, dark gray and brown, silty clay loam. The overburden is reported to be between 80 and 200 feet thick.

A site plan of the facility, including the location of the USTs, return/fill station, and drum storage area, is shown on Figure 2. Figure 3 shows details of the facility layout including approximate USTs and piping locations. Note, the locations of the tanks and piping are approximate; however, actual locations will be verified during excavation at closure. The units scheduled for closure and/or decontamination at this site include the waste management units, and product UST system.

Waste Management Units

The waste management units at the facility that are scheduled for closure under RCRA interim status include:

1. One 12,000-gallon steel UST and associated piping/appurtenances for storage of spent mineral spirits;

2. One 1,300-gallon steel UST and associated piping/appurtenances for storage of spent mineral spirits sludge. The sludge tank has reportedly been removed from service, cleaned and filled with sand.

3. A sheltered containment area (return/fill station) for spent mineral spirits including two 375- gallon wet dumpsters; and

4. An enclosed 677.5 square foot drum storage area for spent immersion cleaner, and dry cleaning waste.

As shown on Figure 2, the 12,000-gallon spent mineral spirits UST is located west of the warehouse/office building. The return/fill station is located to the west of the spent mineral spirits UST. As previously discussed, S-K records indicate the sludge tank, located north of the spent mineral spirits UST, was disconnected, cleaned, and backfilled with sand in 1985. The sludge tank and associated piping will be closed in the same manner as the other USTs.

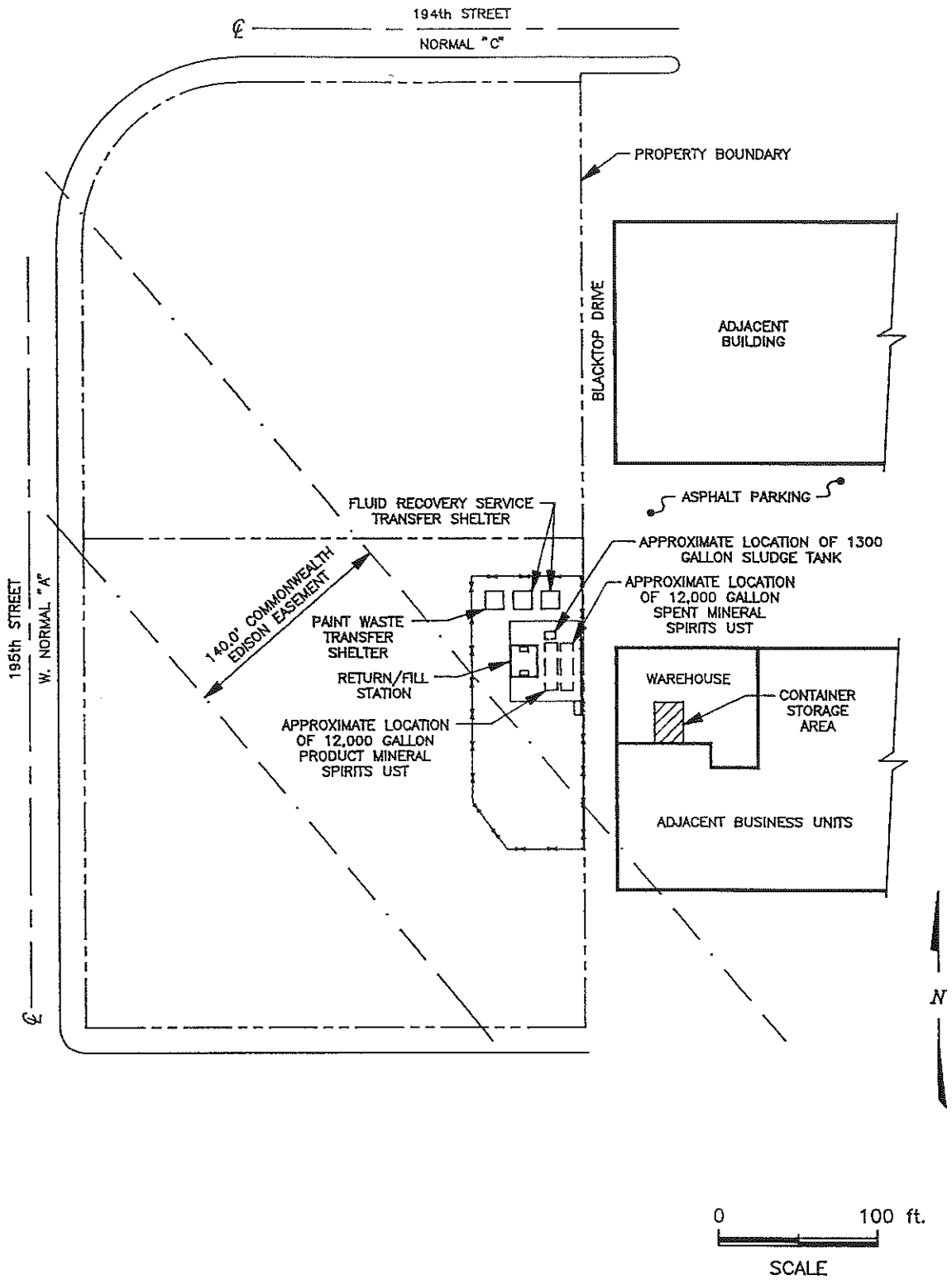


FIGURE 2 :SITE PLAN, SAFETY–KLEEN CORP. SERVICE CENTER, MOKENA, ILLINOIS

SKMISITE

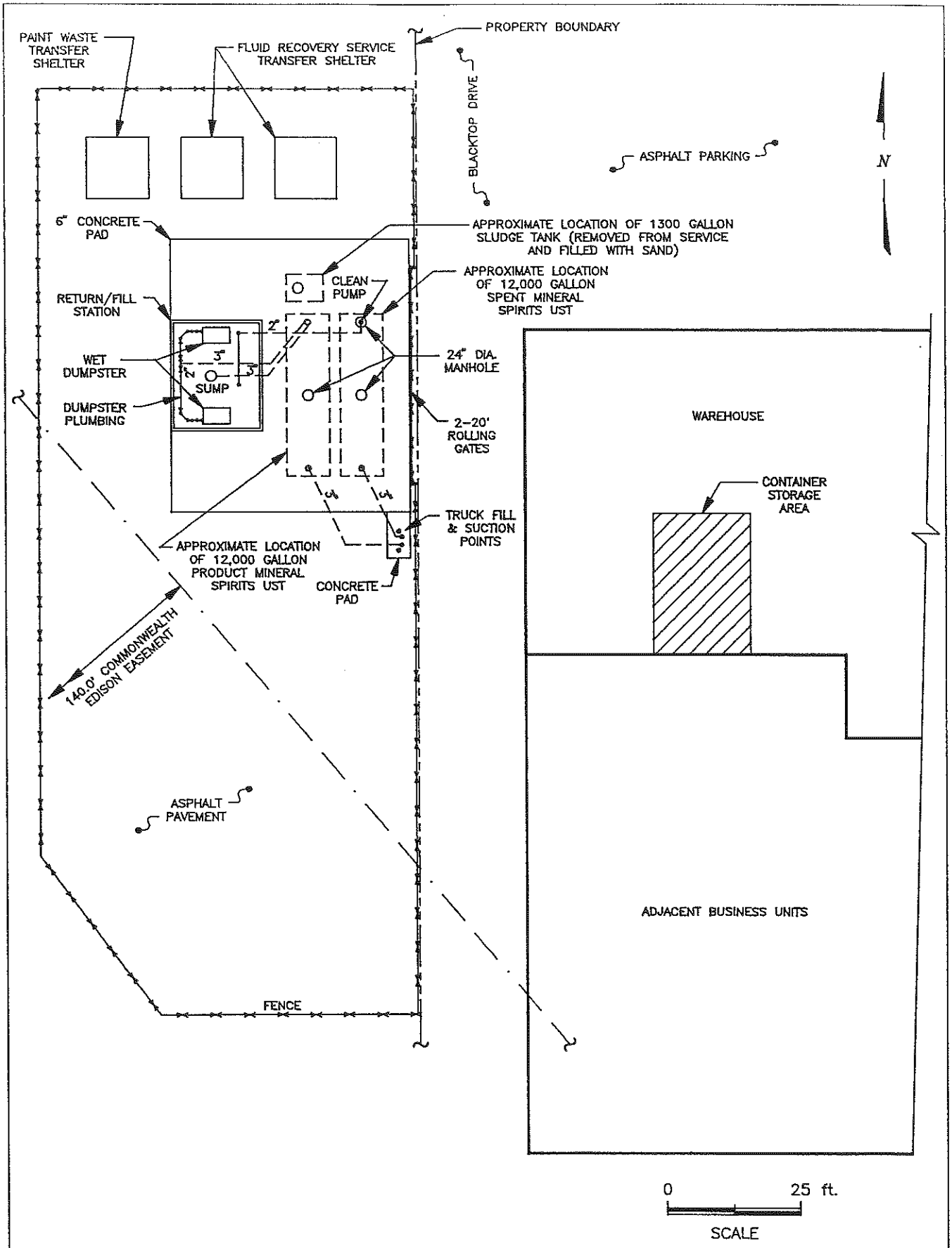


FIGURE 3 :FACILITY LAYOUT, SAFETY-KLEEN CORP. SERVICE CENTER, MOKENA, ILLINOIS

SKMIFACI

A 6-inch thick concrete pad used as a driveway overlies the UST and associated piping. The return/fill station is also underlain by the concrete pad. The remainder of the facility consists of asphalt pavement. A 6-foot high chain-link security fence surrounds the USTs, return/fill station and waste transfer shelters.

Product UST

The 12,000-gallon UST used for storage and distribution of product mineral spirits exists west of the spent solvent UST. The product tank, associated piping, and appurtenances are not part of a waste management unit. The product UST system is scheduled for removal at the same time as the spent mineral spirits USTs.

Fluid Recovery Service Transfer Shelters

The fluid recovery service transfer (FRST) shelters are located north of the USTs. The two FRST shelters are utilized as transfer facilities for the temporary storage of manifested drums of hazardous wastes. The shelters consist of a sloped metal roof, metal sides, and two locked access doors. Drums are stored inside the shelters on raised, perforated platforms which drain to underlying steel containment pans.

Drums stored in the shelters remain less than ten (10) days in accordance with IAC, Title 35, Section 723.112 and are picked up for transport to a S-K recycle center on a weekly basis. In accordance with IAC, Title 35, Section 723.112, transfer facilities are not subject to regulation under sections 702, 703, 724, 725, and 728. However, S-K will decontaminate the shelters during the closure period prior to disassembly and/or possible use at another facility.

Paint Waste Transfer Shelter

The paint waste transfer (PWT) shelter is located northwest of the USTs and is utilized as a transfer facilities for the temporary storage of manifested pails and drums of paint waste (lacquer thinner and paint). The shelter is constructed of continuously welded steel and includes two locking access doors. All containers are stored on a slotted floor, above steel pans which provide secondary containment.

Drums and pails stored in the PWT shelter remain less than ten (10) days. The PWT shelter is not subject to

regulation under parts 702, 703, 724, 725, and 728, in accordance with IAC, Title 35, Section 723.112. S-K will, however, decontaminate the shelter during the closure period prior to disassembly and/or use at another facility.

Maximum Waste Inventory at Closure

An estimate of the maximum inventory of hazardous wastes ever onsite during the active life of the facility is summarized in Table 1. The actual quantity of wastes present at closure will be less than the maximum inventory estimate. This information has been compiled from the most recent facility Part A Permit Application. The constituents listed in Table 1 will form the basis for sampling and analysis conducted during certain closure activities.

Table 1. Waste Stream Characterization and Maximum Inventory of Wastes Which Were Handled at the Safety-Kleen Corp. Service Center, Mokena, Illinois.

Waste Management Area	Waste Stream Characteristics	Maximum Inventory
Spent Mineral Spirits UST System		
- 12,000-gallon UST for spent mineral spirits	- Ignitability (D001) - Toxicity Characteristic (D004, D011, D018, D019, D021-D030, D032-D043)	12,000 gallons
- 1,300-gallon UST for spent mineral spirits sludge*	- Ignitability (D001) - Toxicity Characteristic (D006, D008)	1,300 gallons
Drum Storage Area (16 and 30-gallon drums) for the following:		2,080 gallons
- Spent Immersion Cleaner	- Methylene Chloride (F002) - 1,2-Dichlorobenzene (F002) - Cresylic Acid (F002, F004)	
- Spent Dry Cleaning Waste	- Perchloroethylene (F002) - Trichloro-trifluoroethane (F002) - Mineral Spirits (D001)	
- Spent Mineral Spirits Dumpster Mud	- Ignitability (D001) - Toxicity Characteristics (D004-D011, D018, D019, D021-D030, D032-D043)	
Return/Fill Station with Two Wet Dumpsters		
- Spent Mineral Spirits Dumpster Mud	- Ignitability (D001) - Toxicity Characteristic (D004-D011, D018, D019, D021-D030, D032-D043)	750 gallons

* S-K records indicate the 1,300-gallon UST for spent mineral spirits sludge was removed from service and backfilled with sand in 1985.

CHAPTER II

CLOSURE ACTIVITIES AND SCHEDULE

S-K intends to close and/or decontaminate the waste management units, product UST system, and transfer shelters following approval of this closure plan or receipt of final volume of wastes, whichever is later. Closure activities include decontamination of the drum storage area, return/fill station, USTs and appurtenances, and remediation of possible associated subsurface degradation. The planned activities are intended to meet the closure performance standard of 35 IAC Part 725.211, which is to:

1. Minimize the need for further maintenance; and

2. Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

Closure Objectives

The project specific objectives for closure and/or decontamination of the drum storage area, return/fill station, and UST systems at this service center are as follows:

1. Perform work in accordance with the closure plan, and in coordination with the IEPA and local regulatory agencies.

2. Perform work activities in accordance with appropriate health and safety protocol.

3. Develop specifications for closure activities so that a qualified contractor may be selected to perform the work.

4. Perform closure activities (e.g., USTs removal) in a manner which will minimize potential for damage to adjacent structures.

5. Decontaminate and document "clean closure" of the drum storage area.

6. Dismantle, decontaminate, and document "clean closure" of equipment comprising the return/fill station and wet dumpsters.

7. During tank removal, assess subsurface degradation attributable to this facility in accordance with industry standards and agency regulations.

8. Remediate attributable subsurface degradation to achieve "clean closure" of the UST systems.

9. Document work activities and submit a written report which summarizes and certifies "clean closure" of the waste management units at this facility.

Closure Schedule

S-K intends to close the Mokena facility in 1993. Work activities have been designed to close the waste management units and mineral spirits product tank. The closure 2activities and a schedule for performing closure are outlined on Figure 4. The schedule accounts for notifications, laboratory turnaround time, potential remediation time and will be adjusted accordingly to address agency requirements.

Figure 4. Closure Activities and Schedule of Implementation, Safety-Kleen Corp. Service Center, Mokena, Illinois.

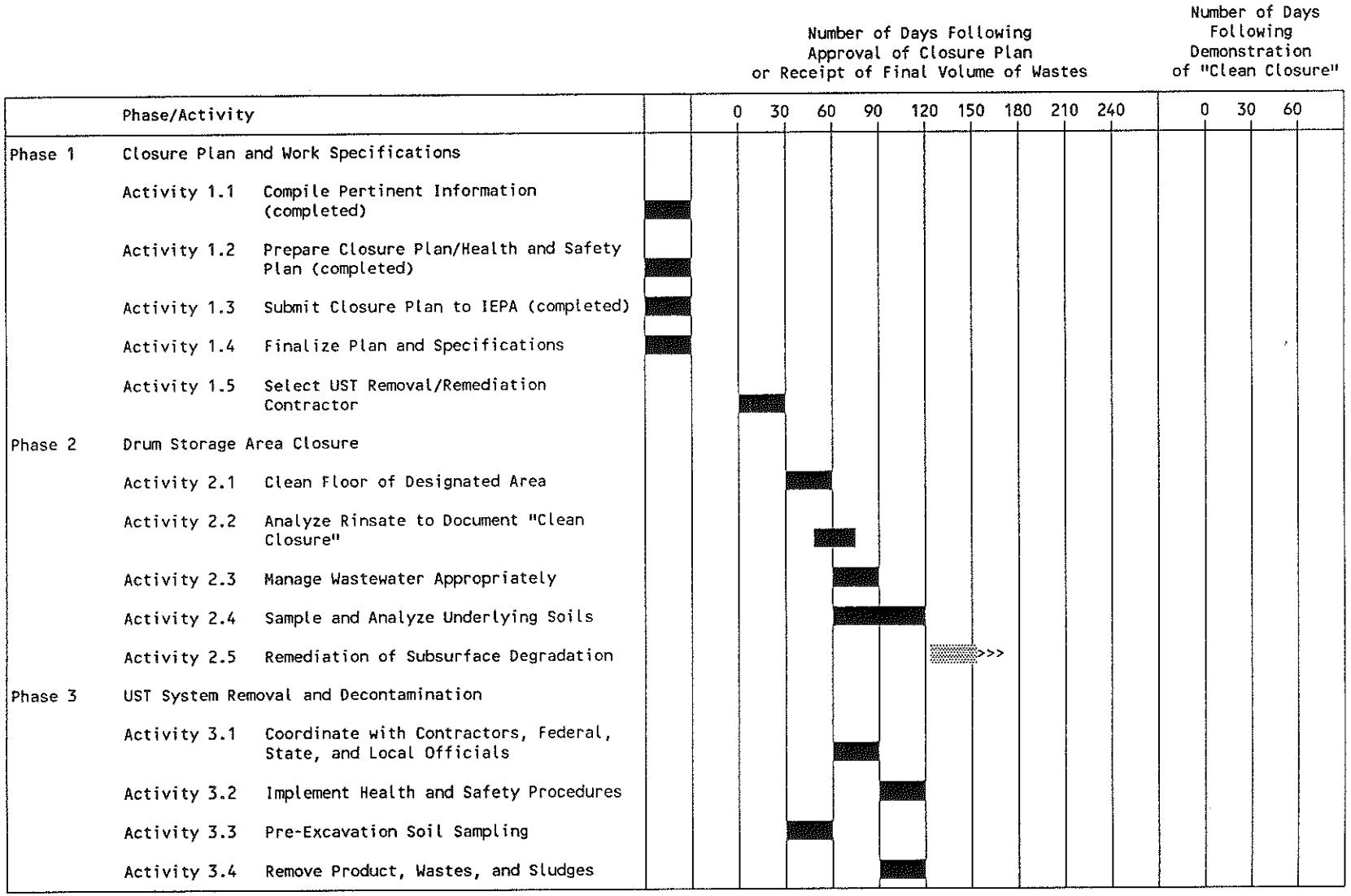


Figure 4. Closure Activities and Schedule of Implementation, Safety-Kleen Corp. Service Center, Mokena, Illinois (continued).

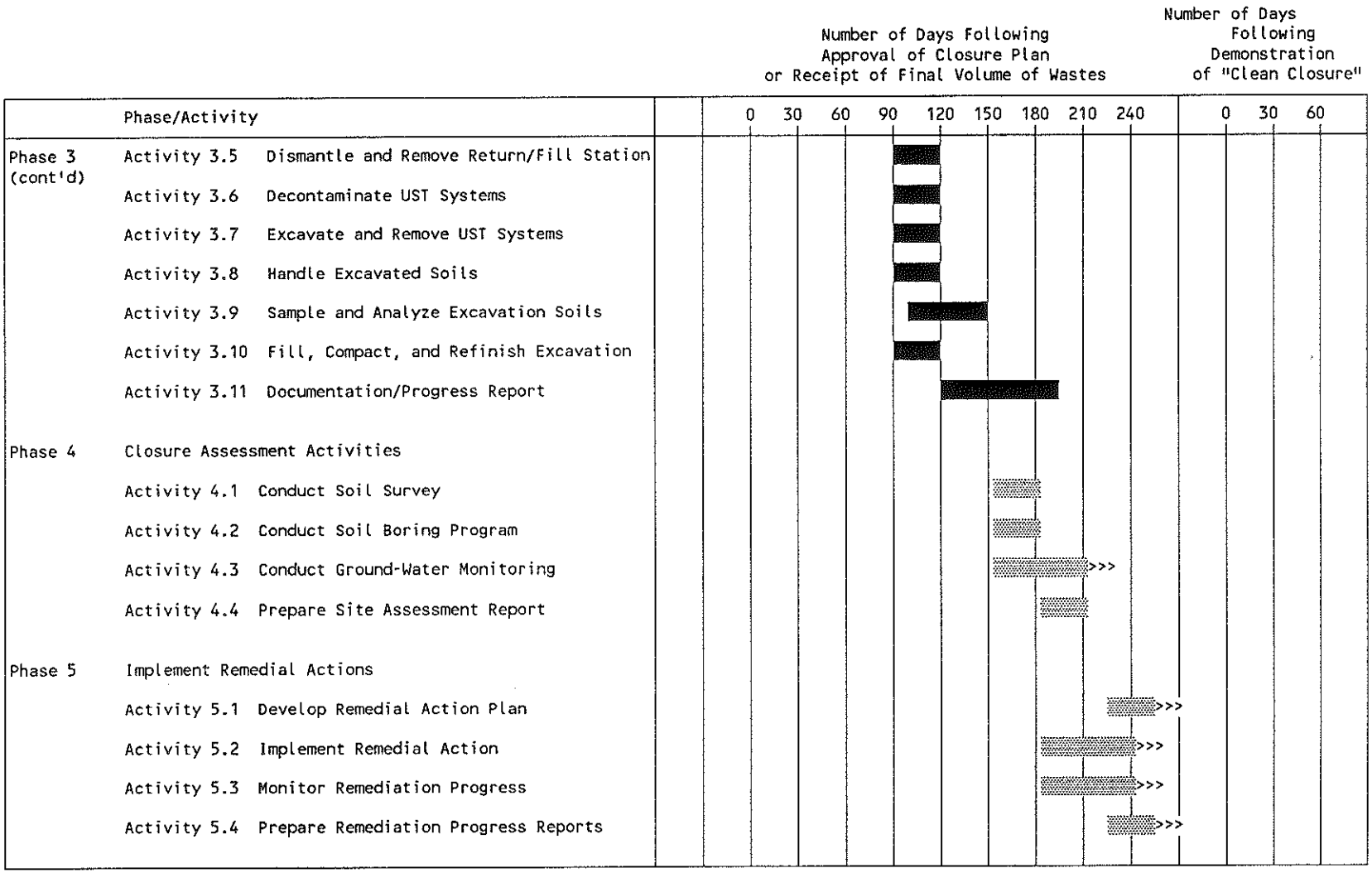
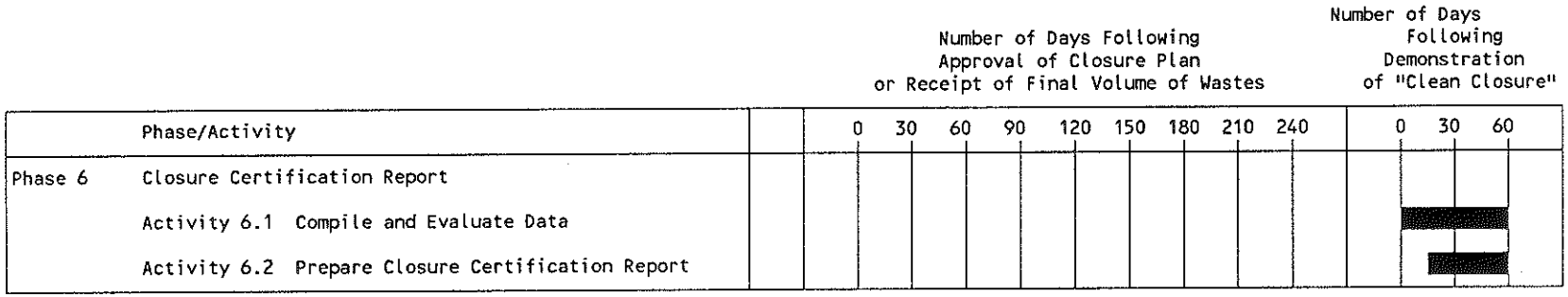


Figure 4. Closure Activities and Schedule of Implementation, Safety-Kleen Corp. Service Center, Mokena, Illinois (continued).



* >>> Tentative activity schedule, if necessary. Activity continues through closure until clean closure.

CHAPTER III

CLOSURE PLAN AND WORK SPECIFICATIONS (PHASE 1)

Safety-Kleen Corp. (S-K) has developed this facility closure plan to summarize procedures for decontamination of the drum storage area, return/fill station, UST systems and appurtenances, and remediation of associated subsurface degradation (if necessary). The work specifications describe procedures for removing, cleaning, and disposing of the tank systems, in addition to vacuum truck service, excavation, and confined space entry.

The specifications consist of guideline documents published by American Petroleum Institute (API), Occupational Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), and National Institute for Occupational Safety and Health (NIOSH). The activities to be conducted during Phase 1 are:

Activity 1.1: Compilation and review of pertinent data and regulations (completed).

Activity 1.2: Preparation of Plans (completed).

Activity 1.3: Submittal of the Closure Plan to IEPA (completed).

Activity 1.4: Finalization of Plans and Specifications.

Activity 1.5: Selection of the UST Removal/Remediation Contractor.

S-K has prepared this closure plan with the intent to decontaminate the hazardous waste management units and achieve "clean closure" to the extent necessary to protect human health and the environment.

Activity 1.1 - Compile Pertinent Information

The closure activities and work specifications are based on the site-specific conditions and materials, applicable regulations, and guidance documents. The sources of information used to develop the closure plan and specifications are as follows:

Closure Plan References

1. "RCRA Part B Permit Application, Hazardous Waste Storage Facility, Safety-Kleen Corp. Service Center, Mokena, Illinois," December 11, 1990 (withdrawn).

2. "Interim Status Requirements for Treatment, Storage, and Disposal Facilities" (35 IAC Sections 725.210 through 725.220 "Closure and Post-Closure" and Sections 725.290 through 725.301 "Tank Systems").

3. "Underground Storage Tanks" (35 IAC Part 731).

Specifications

1. American Petroleum Institute, RP 1604 "Removal and Disposal of Used Underground Petroleum Storage Tanks."

2. American Petroleum Institute, Pub. 2015 "Cleaning Petroleum Storage Tanks."

3. American Petroleum Institute, Pub. 2217 "Guidelines for Confined Space Work in the Petroleum Industry."

4. American Petroleum Institute, Pub. 2219 "Safety Operation of Vacuum Trucks in Petroleum Service."

5. Occupational Safety and Health Administration Standards, "Excavations, Trenching, and Shoring" (29 CFR Sections 1926.850 - 1926.653).

6. Occupational Safety and Health Standards "Permit Required Confined Spaces" (29 CFR Section 1910.146).

7. National Institute for Occupational Safety and Health, "Criteria for a Recommended Standard - Working in Confined Space."

8. National Fire Protection Association, No. 327 "Standard Procedures for Cleaning or Safeguarding Small Tanks and Containers."

The closure plan references and work specifications are incorporated into this plan by reference. All of the closure plan references and specifications will be made available at the site during the applicable closure activities.

Activity 1.2 - Prepare Closure Plan/Health and Safety Plan

This facility closure plan was developed to provide a detailed description of procedures to decontaminate the drum storage area, return/fill station, and UST systems. The closure plan has been prepared to comply with the RCRA interim status regulations in 35 IAC Part 725. The closure activities were designed with the intent to achieve "clean closure" in a safe and efficient manner.

S-K will require contractors working on this project to develop a Health and Safety Plan prior to commencement of onsite assessment and closure activities. The Health and Safety Plan(s) will be prepared in accordance with OSHA regulations in 29 CFR 1910.120. The health and safety protocol will be designed to meet the specific needs of this project and shall be considered a supplement to the work specifications.

All S-K and contractor personnel will follow a Health and Safety Plan developed by the respective companies. Subcontractors will also be encouraged to follow a health and safety plan developed by their respective companies. The primary responsibility for employee safety lies with each individual employer. Each person working onsite must maintain a general responsibility to identify and correct any potential health and safety hazards and cooperate toward working as safely as possible.

Activity 1.3 - Submit Closure Plan to IEPA

Through preparation and submittal of this plan, S-K demonstrates the intent to achieve "clean closure" of the drum storage area, return/fill station, and UST system. This closure plan describes procedures for removal, decontamination, disposal, and remediation of the hazardous waste management units, and product UST system.

Activity 1.4 - Finalize Closure Plan and Work Specifications

Following IEPA review and the public notice period, S-K will revise or modify the plan, if necessary. S-K will address pertinent comments on the closure plan for resubmittal to IEPA. The closure plan may be amended or modified during the closure process pursuant to 35 IAC

725.212c(1)(c) to describe appropriate remedial actions, if subsurface degradation is determined to be associated with the hazardous waste management units at the facility. Any deviations from the approved closure plan will be coordinated with IEPA and documented in the closure progress/certification report.

Activity 1.5 - Select UST Removal/Remediation Contractor

Work specifications will be submitted to several qualified UST removal/remediation contractors with a request for bid. S-K will select a UST removal/remediation contractor(s) based on qualifications, experience, responsiveness, and cost to perform the specified work. The contractor(s) will be required to provide all equipment necessary to perform the specified work, maintain appropriate certification(s), and perform work in a safe and conscientious manner.

CHAPTER IV

DRUM STORAGE AREA CLOSURE (PHASE 2)

An independent professional engineer or designate will function as the S-K representative during closure of the drum storage area (Phase 2). The drum storage area is shown on Figure 3 and consists of a 677.5 square foot area with two containment trenches located near the east and west walls.

The following sections summarize soil sampling and repair activities that have been conducted in the drum storage area. In addition, the tasks required to complete closure of the drum storage area are discussed. S-K intends to decontaminate the drum storage area in order to achieve "clean closure."

Soil Sampling and Analysis

A soil sampling and analysis program was conducted in the drum storage area by Canonie Environmental in June 1991. The purpose of the program was to evaluate the absence or presence, nature, and degree of subsurface degradation underneath portions of the containment trenches which were not lined with concrete. A copy of the letter report describing the results of the soil sampling and analysis program is included in Appendix B.

Repair of Containment Trenches

Based on the results of the soil sampling and analysis program, S-K elected to repair the unlined sections of the containment trenches. As stated in the letter to IEPA dated January 23, 1992, and included in Appendix C, S-K believed that the best course of action was to repair the trenches and implement a site-wide remediation program.

The repair procedure consisted of replacing gravel portions of the trenches with concrete. An epoxy coating was applied to the trench after the concrete had cured. The trenches were subjected to a 24 hour water tightness test to verify that the trenches are sufficiently impervious to contain leaks and spills until the collected

material is detected and removed. Based on the results of the water tightness tests, the trenches were found to be free of cracks or gaps and sufficiently impervious as required by 40 CFR 264.175(b)(1). A certification of the containment trench repair is included in Appendix D.

Phase 2 Closure Activities

The activities necessary to complete closure of the drum storage area include decontamination of the floor and trenches, soil sampling/analysis, and remediation of any associated subsurface degradation.

Activity 2.1 - Clean Floor of Designated Area

1. Remove all remaining drums, containers and ancillary equipment from designated areas. S-K will properly manifest and transport any remaining drums to a S-K recycle facility.

2. Clean floor area and containment trenches with detergent/water solution using wet mops or high pressure steam. Containerize wash water after final cleaning.

3. Continue decontamination of the drum storage area until the floor area and containment trenches appear visually clean.

4. Rinse floor area with wet mops or high pressure steam. Containerize the wash/rinse water.

Activity 2.2 - Analyze Rinsate to Document "Clean Closure"

1. S-K will collect a sample of the final rinse water and submit the sample to a qualified laboratory for analysis. The final rinsate sample will be analyzed for mineral spirits (modified 8015), volatile organic compounds (VOCs - 8240), cadmium (6010), chromium (6010), and lead (7421) in accordance with USEPA SW-846 methods (or equivalent).

2. Evaluate the final rinsate sample analytical results to determine if the floor area and containment trenches are clean. The floor area and containment trenches will be considered clean when the concentration of mineral spirits

does not exceed 10 mg/L, and the concentrations of the VOCs and metals do not exceed the respective drinking water standards.

3. If necessary, re-wash and re-rinse the designated floor area and containment trenches, and resample/analyze the rinsate until the floor area and containment trenches are considered clean.

Activity 2.3 - Manage Wastewaters Appropriately

The wash water and rinse water shall be kept to a minimum during cleaning of the drum storage area. The wash water and rinse water shall be containerized in a vacuum truck or sealable barrels provided by S-K. Wash water and rinse water will be manifested and transported to a permitted TSD facility (S-K Recycling Center) for treatment. The containerized water may be temporarily stored onsite (less than 90 days) until the waste can be transported to the S-K recycling center.

Activity 2.4 - Sample and Analyze Underlying Soils

An investigation will be performed within the drum storage area and warehouse building to evaluate the characteristics of any subsurface impacts in the drum storage area and containment trenches. The objectives of this investigation will be to identify the nature and degree, and determine the vertical extent, of subsurface degradation within the drum storage area. The initial investigation will include a soil gas survey and soil sampling/analysis program. Additional soil sampling and analyses will be conducted to determine the lateral extent of any subsurface degradation due to the drum storage area as part of Phase 4, if necessary.

Shallow Soil Gas Survey

S-K intends to conduct a shallow soil gas survey in the drum storage area to evaluate the extent of subsurface impacts. Shallow soil gas will be measured on a grid pattern (approximately 10 feet x 10 feet) with photionization detector. A field gas chromatograph may also be used to analyze shallow soil gas in the drum storage area.

Shallow soil gas will be monitored through small diameter testholes which will be drilled through the concrete floor to a depth of approximately 3 feet. Monitoring will commence near the containment trenches and extend radially away to estimate the extent of degradation,

if practicable. A detailed description of the soil gas survey procedures is presented in Phase 4.

Soil Sampling Locations

Soil samples will be collected from the north and south ends of both containment trenches to evaluate the nature, degree, and vertical extent of any subsurface degradation. The initial soil samples will be collected from each location at a depth approximately 6 inches below the bottom of the concrete trench floors. Additional soil samples will be collected from each location at 2-foot depth intervals between the bottom of the containment trench and shallow ground-water table or extent of surface impacts (based on field screening), if practicable.

Soil Sampling Procedures

Testholes will be advanced through the bottom of the containment trenches using an electric rotary hammer drill or concrete coring device. Shallow soil samples will be collected in accordance with the procedures presented in Appendix E. Soil samples will be collected in clean brass rings or packed in clean glass jars using a hand auger, trier sampler, split-spoon sampler of other suitable device. All sampling equipment will be decontaminated prior to each use with a detergent solution wash and distilled water rinse.

The sample containers will be sealed with teflon sheeting and tight-fitting caps, labeled, and packed on ice in an opaque cooler. A completed chain-of-custody/sample-analysis-request (COC/SAR) form will accompany the samples to a qualified/certified laboratory. The samples collected for laboratory analysis will not be subjected to field screening procedures.

A small aliquot of soil from each sample interval will be logged by a qualified geologist and field screened with a PID. Field screening will consist of placing an aliquot of sample in a clean glass jar or plastic zip-lock bag and measuring the total organic vapor (TOV) concentration of the headspace. The field screening data will be evaluated to estimate the vertical extent of subsurface impacts.

Laboratory Analyses

The soil samples collected in June 1991 were analyzed for mineral spirits and VOCs, as indicators of potential subsurface degradation. S-K intends to analyze the soil

samples collected during the closure activities for parameters which are representative of wastes managed in the drum storage area. The soil samples will be analyzed for the following parameters to provide verification of the initial analytical results (June 1991) and additional characterization information:

Parameter	USEPA SW-846 Method*
Mineral Spirits	Modified 8015
Volatile Organic Compounds	8240
Semi-Volatile Organic Compounds	8270
Cadmium, Chromium and Lead	6010

(*USEPA SW-846 -"Test Methods for Evaluating Solid Waste")

The laboratory data will be evaluated to determine whether additional assessment and/or remediation are necessary to achieve clean closure of the drum storage area. S-K will work with IEPA to satisfy the closure performance standard and achieve "clean closure." Additional assessment activities may be implemented as necessary to further evaluate the extent of subsurface degradation underlying the drum storage area, if necessary. The additional assessment activities will be performed in conjunction with the Phase 4 site assessment activities.

Activity 2.5 - Remediation of Subsurface Degradation

The results of the additional assessment activities will be evaluated to determine whether remediation of soils underlying the drum storage area are necessary to achieve clean closure. If remediation is determined to be necessary, S-K will prepare a closure plan modification which addresses procedures to efficiently achieve clean closure. S-K may implement a remedial action program (Phase 5) which addresses potential subsurface degradation on a site-wide basis, if necessary.

S-K and the engineer will certify closure of the drum storage area when the facility has been decontaminated in accordance with this closure plan. A summary of the closure procedures, analytical results, and disposal methods will be included in the closure certification report (Phase 6). Any modifications of these closure procedures will be coordinated with IEPA and presented in the closure certification report.

CHAPTER V

UST SYSTEM REMOVAL AND DECONTAMINATION (PHASE 3)

An independent professional engineer or designate will function as the S-K onsite representative during closure activities. Engineer or designate should be considered synonymous for this project. The engineer will supervise UST removal, decontamination, remediation, and document the closure activities. The principal responsibilities and procedures for performing Phase 3 are described in this chapter as activities 3.1 through 3.11.

Decontamination of the return/fill station, removal of the spent mineral spirits tank and spent mineral spirits sludge tank, and remediation of associated soils, if necessary, will be managed under the RCRA hazardous waste regulations and in accordance with this closure plan. The mineral spirits product tank and subsurface degradation associated with the product tank, if present, are not subject to RCRA hazardous waste closure regulations. The product tank removal and associated remediation, if necessary, will be managed in general accordance with this plan and applicable regulations listed in 35 IAC Part 731.

Activity 3.1 - Coordinate With Contractors, Federal, State and Local Officials

The engineer will coordinate with the selected contractor(s), and Federal, State, and local officials to ensure that the closure activities are performed in accordance with the work specifications and this plan. The contractor(s) will be responsible for contacting local utility companies to mark and/or disconnect underground lines prior to any onsite excavation work.

Activity 3.2 - Implement Health and Safety Procedures

The four principal health and safety concerns on this project involve combustible or flammable vapors in the work area, confined space entry/oxygen deficient atmospheres, and structural integrity of the excavation, and possible contact with hazardous waste. These concerns will be addressed through implementation of precautionary measures

described in the work specifications and Health and Safety Plan(s).

Activity 3.3 - Pre-Excavation Soil Sampling

S-K will characterize the soil in the vicinity of the USTs prior to excavation. Samples will be collected and analyzed to determine appropriate disposal and handling procedures for soil to be excavated during removal of the USTs. The results of the pre-excavation soil sampling and analyses will also be evaluated to determine the absence/presence, nature, and degree of subsurface degradation (if present) which may be associated with the USTs.

Predetermination of soil quality characteristics will allow S-K to efficiently obtain appropriate approvals and permits for disposal and/or treatment (if necessary) of the excavated soils prior to removal of the USTs. In this way, soil stockpiling will be minimized. The following procedures will be implemented to determine the characteristics of soil to be excavated.

1. Representative soil samples will be collected with a hand auger or other suitable methods at a minimum of four borehole locations immediately adjacent to the USTs. The soil samples will be collected at 2.5-foot intervals between ground surface and a depth of approximately 12 feet below ground surface (bgs) or the shallow ground-water table, whichever comes first. One borehole will be advanced and sampled on each side of the tank battery.

2. Soil samples collected at each location will be field screened with a photoionization detector (PID) between ground surface and total depth. The PID measurements will be determined by placing an aliquot of soil in a clean glass or plastic container. After a temperature equilibration period, the headspace vapors in the container will be measured with the PID through a small hole or seal. The PID will be calibrated on a daily, and as needed, basis with a 100 ppm isobutylene standard to determine relative total organic vapor (TOV) concentrations.

3. The soil sample from each borehole which exhibits the highest degree of degradation (if present), based on field screening, will be submitted to a laboratory for analysis of parameters which are

characteristic of wastes stored in the USTs (Table 2). The most impacted sample (based on field screening) will also be analyzed for typical parameters which are required by a soil treatment and/or disposal facility (Table 2).

4. Samples selected for laboratory analyses will be collected in clean brass rings or glass jars, sealed with teflon sheeting and plastic caps, labeled and packed on ice in a cooler. The soil sample will be submitted to a certified/qualified laboratory along with a chain-of-custody/sample analysis request form.

S-K will request approval from IEPA and the potential disposal facility to dispose/treat (if necessary) the soils to be excavated based on the laboratory analytical results. It should be noted that soil impacted by mineral spirits is typically non-hazardous, based on previous experience at many similar S-K sites.

Activity 3.4 - Remove Product, Wastes and Sludges

The locations of the return/fill station and UST systems are shown on figures 2 and 3. S-K anticipates that the quantity of product, wastes, and sludges remaining in the USTs and return/fill station will be minimal at the time of closure. However, the contractor shall be responsible for accessing the USTs and return/fill station (wet dumpsters) to remove any remaining liquids and sludges. The contractor shall also be responsible for locating and securing any utilities prior to excavation work.

Precautionary measures must be implemented to prevent sparks and eliminate sources of ignition during work on the return/fill station and USTs. All equipment utilized must be explosion proof because potentially combustible vapors may exist in the tanks and lines. No personnel will be allowed to enter the tanks without proper respiratory protection. All tank work shall be in accordance with the specifications and coordinated with the engineer.

Proper procedures for vacuum truck operations are described in the work specifications, which will be available onsite during closure activities. The contractor shall remove as much remaining product, spent mineral spirits and other liquids from the return/fill station (wet dumpsters) and USTs as possible. The contractor shall properly containerize and prepare the liquids for transportation to a S-K recycling center. The liquids may be stored up to 90

Table 2. Pre-Excavation Soil Boring Program Parameters and Analytical Methods, Facility Closure, Safety-Kleen Corp. Service Center, Mokena, Illinois.

Samples/Parameters	Analytical Methods[1]
Characterization Samples (4)	
Mineral Spirits	Modified 8015
Volatile Organic Compounds (VOCs)	8240
Semi-Volatile Organic Compounds (SVOCs)	8270
Cadmium, Chromium, and Lead	6010
Disposal/Treatment Characterization Sample(1)	
TCLP-VOCs	1311/8240
TCLP-SVOCs	1311/8270
TCLP-Metals	1311/6000-7000 series
PCBs	9015
Total Recoverable Phenols	9065
Compatability with Water	Chap. 7.3.4.1
Sulfide Reactivity	Chap. 7.3.4.1
Total Cyanide	9010
Cyanide Reactivity (if Total $\geq$10 mg/kg)	Chap. 7.3.4.2
Corrosivity	9045
Ignitability	Modified Open Cup
Free Liquids (Paint Filter)	9095
Percent Total Solids	Dry @ 105^{o}C
Percent Ash Content	Ash @ 600^{o}C

[1] Test Methods for Evaluating Solid Wastes, USEPA SW-846 (or equivalent).

days in a lockable tank, tanker, or vacuum truck until S-K personnel can off-load the containers.

Non-pumpable sludges and residue may exist in the wet dumpsters and tanks after removal of the liquids. The contractor may be required to manually remove as much remaining sludge and residue as possible. S-K or the contractor shall provide auxiliary pumps and high pressure steam cleaning equipment to loosen scale/residue from the interior of the wet dumpsters and tanks. The contractor shall provide a vacuum truck and/or drums to containerize the sludge and residue. Non-flowable (nonpumpable) waste solids shall be containerized in 16 gallon barrels, labeled and manifested for handling and transport to a permitted TSD (i.e., S-K Recycling Center).

The sludge tank has reportedly been cleaned and filled with sand. The sand will be removed from the tank either manually or with a backhoe by the contractor. The evacuated sand will be handled in the same manner as the excavated soils. Procedures for handling the excavated soils are presented in Activity 3.8.

Activity 3.5 - Dismantle and Remove Return/Fill Station

The return/fill station will be cleaned, dismantled, and temporarily stored in the warehouse until removed from the site. The engineer shall inspect the dismantled return/fill station to determine its condition. The contractor will scrap or stockpile the disassembled return/fill station as directed by the engineer or S-K. The return/fill station will be closed according to the following procedures.

1. Any mineral spirits remaining in the wet dumpster and/or secondary containment area will be transferred to the spent mineral spirits UST. The sludge in the wet dumpsters will be removed, drummed and labeled or pumped directly into a vacuum truck, and manifested for proper disposal at a S-K Recycling Center.

2. The wet dumpsters, secondary containment pan, metal shelter, and dock area will be decontaminated using a high pressure wash system with hot water/detergent solution, scrub brushes, squeegees, and scrapers (as necessary). The piping to the USTs will also be flushed with a high pressure water/detergent solution.

3. Washing and flushing will continue until the rinsate appears visually clean. The wash/rinse water and any residue generated during decontamination will be collected and containerized for transport to a S-K recycle center. The wash/rinse water and residue will be handled at the recycle center.

4. Decontamination of the return/fill station components will continue until the surfaces appear visually clean. Stains and residue will be removed to the extent practicable.

5. To document decontamination, a sample of the final rinsate will be collected, containerized, and allowed to equilibrate to room temperature. The return/fill station will be considered decontaminated when field screening with a PID (calibrated to a 100 ppm isobutylene standard) indicates a concentration of less than 10 ppm TOV in the headspace. The return/fill station will be rewashed and rinsed, if necessary, until designated clean in accordance with this plan.

6. Following decontamination, the return/fill station and components will be dismantled and stockpiled in a secure area. The return/fill station components will be cut up and hauled to a metal scrap/recycling yard in accordance with 35 IAC 721.106.

Activity 3.6 - Decontaminate UST Systems

The USTs shall be freed of flammable or combustible vapors by the contractor after removal of all remaining liquids and residue. Procedures for purging or venting the tanks are described in the specifications. The engineer and contractor will monitor vapors to ensure the tank atmosphere has combustible gas concentrations less than 10% of the lower explosive limit (LEL).

Tank Opening and Entry

Tanks with insufficient access to properly remove sludges and residue may need to be breached by the contractor. Penetration of the tank shell must be permitted by the engineer or qualified UST contractor. Personnel

must wear proper respiratory protection and protective clothing during this activity. All work on the tanks shall be in accordance with the work specifications.

Positive ventilation may be provided to the tank(s) immediately after opening, if necessary. No person(s) shall enter the tank without appropriate respiratory protection. Personnel entering confined spaces shall at a minimum follow all established OSHA and/or NIOSH protocol.

The engineer and contractor shall monitor the work area and tank atmospheres for combustible gas concentrations and oxygen deficiency in order to determine appropriate respiratory protection and health and safety precautions. Protocol for tank entry, as stipulated in the work specifications, will be strictly enforced throughout the project. The "buddy watch" system will be implemented at all times during tank entry.

Decontamination of Tanks and Appurtenances

The tanks may be excavated and removed as soon as all sludges and residue have been removed and the tank atmosphere has been reduced to the acceptable limits of combustible gas concentration. However, in order to prevent possible spills of hazardous substances or wastes which could occur during UST removal, S-K will require preliminary decontamination of these tanks before extraction. The mineral spirits tanks shall be cleaned by the contractor in accordance with the work specifications.

Preliminary decontamination of the tanks will consist of removal of all sludge and residue and a high pressure wash. The tank interior may need to be scraped or squeegeed to remove rust, residue, or scale. The engineer will supervise tank decontaminating operations and determine when the tank appears visually clean. Final decontamination work may be performed following removal of the tanks, piping, and appurtenances.

The tanks, appurtenances, and piping shall be flushed with a detergent solution. Flushing shall continue until the appurtenances and piping have been designated clean by the engineer. A sample of the final rinse water will be collected, containerized, and allowed to equilibrate to room temperature. The tanks, appurtenances, and piping will be considered clean when field screening with a PID (calibrated to a 100 part per million (ppm) isobutylene standard) indicates a concentration of less than 10 ppm TOV in the headspace.

The decontaminating wash solution shall be kept to a minimum during cleaning of the tanks. The decontaminating wash solution and residue shall be containerized in a vacuum truck or sealable barrels provided by the contractor. The residue and sludges shall be separated from the washwater as best as possible. All residue, sludges, washwater, and rinse water will be transported by S-K to the recycling facility for disposal. All contaminated clothing, supplies, etc. used during UST cleaning will also be containerized and disposed of appropriately. The containerized wastes may be stored onsite for up to 90 days until the waste can be transported to the S-K recycling center.

Activity 3.7 - Excavate and Remove UST Systems

The tanks shall be removed by the contractor in accordance with specifications contained and/or referenced in this closure plan. The UST appurtenances and piping shall also be removed by the contractor. Construction debris and soil excavated during removal of the tanks shall be stockpiled in a secure area. Once removed, the USTs will be visually inspected by the engineer and condition documented with photographs. The tanks shall be clearly labeled and stored with the vent opening at the top.

The contractor shall arrange for disposal of the tanks, piping, appurtenances, and construction debris at acceptable facilities as designated by S-K and/or the engineer. The tanks shall be rendered unusable (e.g., cutting into small pieces or three large punctures) by the contractor, prior to shipment. The contractor shall be responsible for providing a certificate of destruction to S-K. The contractor shall transport the decontaminated tanks, piping, and appurtenances to a scrap metal recycling facility in accordance with 35 IAC 721.106. The contractor shall be responsible for obtaining permits necessary to handle and transport the tanks.

Activity 3.8 - Handle Excavated Soils

The contractor will appropriately remove, handle, and stockpile soils as directed by the engineer. Soils shall be initially excavated to the extent necessary to remove the USTs, piping and appurtenances. Additional excavation may be conducted as part of the Phase 5 remedial action program.

Excavation of Soils

Approximately 60 to 70 cubic yards of soil will be excavated in order to remove the USTs. In addition, an estimated 25 cubic yards of concrete rubble will be removed from the site and disposed at an appropriate facility.

The contractor will be required to secure the excavation and provide access for inspection and sampling in accordance with 29 CFR 1926 Subpart P (latest revision). Excavations greater than five feet deep may require the sides to be sloped no more steeply than 1.5 horizontal to 1 vertical (29 CFR 1926.652). If site conditions prohibit sloping side walls, the contractor may be required to install shoring for safety and/or to prevent structural damage to adjacent foundations. Any underground lines adjacent to or crossing the excavation must also be supported. Procedures for securing the excavation are presented in the specifications.

Classification of Excavated Soils

The contractor shall excavate soils to the extent necessary to remove UST systems. The contractor will be responsible for excavating, stockpiling, or containerizing the soils as directed by the engineer. The engineer will direct excavation and stockpiling of soils based on physical characteristics and field screening methods described below.

The engineer will collect representative samples of the soil during excavation to determine the proper handling. A portion of each sample will be placed in a clean and labeled glass jar with an air tight lid. The samples will be classified as clean (non-hazardous) according to the following field screening methods and criteria:

1. Physical Characteristics - Soils exhibit little or no mineral spirits or hydrocarbon-like odor or discoloration.

2. Total Organic Vapor Concentration - PID headspace measurement of the soil sample does not exceed 20 ppm.

3. Ignitability - Sample does not ignite or react when exposed to air, moisture, or open flame.

Soils which are determined to be clean, based on field screening, may be stockpiled separately in a designated area. Soils which fail one or more of the three criteria will be considered degraded and stockpiled on plastic

sheeting or other container (e.g. roll-off dumpster). Degraded soils will be characterized as hazardous or non-hazardous based on the pre-excavation soil sampling and analysis program (Activity 3.3). S-K will manage the degraded soils as described in the next section.

S-K may opt to utilize soils which appear to be clean (based on field screening) for excavation backfill. If so, samples will be collected from the stockpile of clean soils and tested to determine whether the soils are actually non-degraded. Three representative soil samples will be collected from the clean soil stockpile in brass rings in accordance with the procedures listed in Appendix E. The brass ring samples will be sealed with teflon tape and packed in ice. The samples will be shipped within 24 hours to an IEPAcertified laboratory under chain of custody.

The samples from the clean soil stockpile will be analyzed for mineral spirits (modified 8015), VOCs (8240), and cadmium chromium, and lead (6010) in accordance with USEPA SW-846 methods (or equivalent). S-K will evaluate the analytical results to determine whether the excavated soils may be used as clean backfill. The soil stockpile will be considered clean and suitable for backfill, if the concentrations of the representative parameters are nondetectable (less than USEPA SW-846 PQLs) or less than background conditions (published or site-specific data).

Handling of Excavated Soils

Soils determined to be clean by the procedures described in the previous section will be used to backfill the excavation. The procedures used to handle degraded soils will depend on whether they are hazardous or non-hazardous. Soils degraded by mineral spirits are typically found to be non-hazardous, based on results of soil characterization conducted during closure at many other S-K sites.

In the unlikely event that excavated soils exhibit the characteristic of ignitability or toxicity, the contractor will transport excavated degraded soils in a lined and sealed container to an appropriate hazardous waste treatment/disposal facility. The contractor will be responsible for obtaining necessary permits to transport hazardous wastes. All soils designated as hazardous will be handled, manifested, and transported in accordance with 35 IAC Parts 722 and 723.

Non-hazardous degraded soils may be temporarily stock-piled on plastic sheeting in an area designated by the engineer. The non-hazardous degraded soils may also be

directly loaded and transported to an appropriate treatment/disposal facility. The non-hazardous soils will be appropriately managed as a non-hazardous special waste.

Air monitoring will be routinely performed around the degraded soil stockpile. Air will be monitored with a PID in the breathing zone. Special precautions will be taken to secure the stockpile if PID readings exceed 10 ppm at the S-K property line. The contractor may be required to implement vapor and dust control measures such as covering the stockpile.

Activity 3.9 - Sample and Analyze Excavation Soils

S-K will sample soils from the excavation following removal of the USTs and piping. The objectives of the excavation sampling and analysis program are as follows:

1. Determine the absence or presence of subsurface degradation;

2. Determine the degree and characteristics of subsurface degradation, if present; and

3. Develop a basis to establish cleanup objectives and further assessment activities, if necessary.

The excavation sampling and analysis program will also be used to verify clean closure if subsurface degradation is not detected in the vicinity of the USTs. In addition, this sampling and analysis program will be implemented to verify clean closure, if excavation and disposal/treatment of degraded soils is determined to be the most feasible remedial action.

Sampling Locations and Procedures

Samples will be collected in accordance with the procedures in Appendix E following removal of the tanks and associated piping. Following removal of the USTs, representative soil will be collected from the walls and floor (if feasible) of the excavation. Samples will be collected from the following locations:

1. Two samples each will be collected from beneath the bottom invert of the 12,000-gallon spent mineral spirits UST and 12,000-gallon product UST. The two samples will be taken from the bottom invert of each tank at a distance of

one-third of the length of the tank, measured from the north end of the tank for one location and measured from the south end of the tank for the other location.

2. One sample will be collected from beneath the bottom invert of the 1,300-gallon sludge UST.

3. Four soil samples will be collected from the walls of the excavation, one sample from the center of each wall. If visually discolored or degraded material exists within an area to be sampled, the placement of the sampling locations will be adjusted to include such visually discolored or degraded areas.

4. Representative samples will be collected along pipe runs at locations based on field screening.

   a. If field screening indicates the absence of degradation, samples will be collected at intervals not to exceed 10 feet.

   b. If field screening indicates the presence of degradation, up to four representative samples will be collected from areas with the most elevated total organic vapor measurements.

The samples will be collected from the tank or pipe bedding/natural soil interface to a depth of one foot beyond this interface. Soil samples will not be collected from the floor (beneath tank inverts), if ground water is present in the excavation.

If ground water is present in the excavation, eight soil samples will be collected from the walls of the excavation immediately above the water table - two samples proportionally spaced along each wall. If visually discolored or degraded material exists within an area to be sampled, the placement of the sampling locations will be adjusted to include such visually discolored or degraded areas.

Field Screening Procedures

A qualified field engineer will collect representative samples from the excavation soils and along pipe runs. The soil samples will be characterized for texture, color, staining, and odor. A sufficient number of samples will be collected to adequately define the absence/presence and degree of subsurface degradation, if present.

An aliquot of soil from each sampling location will be sealed in a clean glass or plastic container. After a temperature equilibration period, the headspace vapors in each container will be measured with a photoionization detector (PID) through a small hole in the lid/seal. The PID will be calibrated (daily and as needed) with a 100 ppm isobutylene standard to determine relative total organic vapor concentrations.

The PID measurement, physical soil description, and respective sample location will be recorded in a field log book. Soil samples which do not exhibit solvent staining, odor, and/or total organic vapor concentrations less than background will be considered clean. The field screening results will be used as a preliminary assessment of subsurface impacts.

Sample Analyses

Soil samples collected from the USTs excavation and pipe runs will be analyzed for the constituents detected during the pre-closure soil sampling program (Activity 3.3). All soil samples will be submitted to a qualified/certified laboratory. The potential analyses and analytical methods are as follows:

Parameter	USEPA SW-846 Method*
Mineral spirits	Modified 8015
Volatile organic compounds	8240
Semi-volatile organic compounds	8270
Cadmium, chromium, and lead	6010

*USEPA SW-846 "Test Methods for Evaluating Solid Waste"

If degraded soils and/or ground water are present following removal of the USTs, S-K will work with IEPA to satisfy the closure performance standard and achieve "clean closure." Additional assessment and/or remediation may be performed during Phase 4 and Phase 5, if necessary.

Sample Handling Procedures

Soil samples (eight minimum) selected for laboratory analyses will be collected in clean brass rings or glass jars using a hand auger, trier sampler, trowel, and/or other suitable device. The sample containers will be sealed with teflon sheeting, capped, labeled, and packed on ice in an opaque cooler. A completed chain-of-custody/sample analysis-request form will accompany the samples to the

laboratory. The soil samples will be shipped overnight to a certified/qualified laboratory.

Activity 3.10 - Fill, Compact, and Refinish Excavation

The dimensions and configuration of the excavation will be determined by the engineer prior to filling and finishing. The perimeter corners will be temporarily marked with a shiner and triangulated to a permanent datum. The configuration of the former USTs excavation will be plotted on an accurate base map to document the location of the excavation.

The contractor shall fill, compact, and repave the excavation to match the existing grade. The contractor shall be responsible for obtaining and hauling clean fill (approximately 60 to 70 cubic yards) to the site. The fill shall consist of roadbase or gravel material which is easily compactible. The fill shall be placed in a manner to prevent settlement of the subgrade.

A minimum 6-inch thick concrete or 4-inch thick asphalt pavement layer shall be placed to match existing site conditions. The pavement construction, materials (e.g. wire mesh fabric, expansion joint material, etc.), placement and finish shall match existing conditions and be suitable for driveway/parking use. A gravel base material or asphalt mix may need to be placed over other onsite disturbed areas to match existing conditions.

The engineer shall supervise the fill, compaction, and finish of the disturbed areas. The contractor shall be required to clean up the site following closure activities to the satisfaction of the engineer and S-K.

Activity 3.11 - Documentation and Progress Report

The engineer shall document the completion of Phase 3 activities, which include decontamination and removal of the return/fill station and USTs. Documentation shall consist of field notes, photographs (before, during, and after), site detail maps, field data, and laboratory data. In addition, the engineer will substantiate the following performance items:

1. Dates and times of closure activities;

2. Quantity of soils removed and transported, and the disposal locations;

3. Quantity of wastes removed and transported, and the disposal locations;

4. Miscellaneous materials handled and transported, and the disposal locations; and

5. Dimensions, locations, and configuration of excavation.

A progress report will be prepared and submitted to IEPA which summarizes the decontamination and removal activities (Phases 1 through 3). The closure progress report will be submitted to IEPA within 60 days after completion of the necessary closure activities and receipt of complete and accurate laboratory data.

CHAPTER VI

CLOSURE ASSESSMENT ACTIVITIES (PHASE 4)

S-K is committed to achieving clean closure at this facility. S-K will implement an investigation in the vicinity of the drum storage area, former USTs and return/fill station area to evaluate the extent and degree of subsurface impacts (if present). The objectives of this investigation will be to:

1. Determine that clean closure has been or can be achieved in accordance with the approved closure plan.

2. Develop site-specific information necessary to design an efficient remedial action program (Phase 5).

3. Generate data to establish site-specific clean closure levels for degraded soils and ground-water (if present).

The investigation will include a shallow soil gas survey and soil boring/sampling and analysis program. Ground-water quality will also be evaluated if the soil boring results indicate that subsurface degradation extends to the uppermost aquifer. This closure assessment may be modified based on site-specific information generated during the drum storage area (Activity 2.4) and pre-excavation (Activity 3.3) soil sampling/analysis programs.

Activity 4.1 Conduct Soil Gas Survey

The shallow soil gas survey will be used as the initial assessment of potential subsurface impacts due to volatile organic compounds. A 20 x 20 foot grid pattern will be established over much of the site, and monitoring will commence in a radial pattern extending away from the drum storage area, former USTs, and return/fill station area. Total organic vapor concentrations will be measured in the shallow soil gas to estimate the extent of subsurface degradation (if present). A sufficient number of grid points will be monitored to identify areas and relative levels of potential subsurface soil degradation.

Small diameter test holes will be constructed at the grid points to depths of approximately three feet using an electric rotary hammer drill. The PID instrument probe will be lowered to the bottom and sealed at the surface, immediately after construction of each test hole (Figure 5). The relative total organic vapor concentration will be measured in parts per million (ppm) at each testhole using a PID. The instrument will be calibrated using a factory prepared 100 ppm isobutylene standard at the beginning of each day and as needed during the survey.

Selected soil gas samples may also be analyzed with a field gas chromatograph (GC), to characterize the volatile organic vapors. Selected soil gas samples may be collected from testholes which exhibit elevated PID readings. The chromatograms generated from the shallow soil gas will be compared to standard chromatograms generated under similar conditions. Characterization of the soil gas will be valuable in the differentiation of subsurface degradation from the facility and/or other possible sources.

Activity 4.2 Borehole Soil Sampling Program

The elements of the soil boring program include field screening and collection and analysis of soil samples to define the horizontal and vertical extent of degradation, if present. A minimum of eight boreholes will be strategically located to define the onsite lateral and vertical extent of subsurface impacts, if present. Two soil borings will also be constructed and sampled to document background conditions (Figure 6). Additional boreholes will be sited to determine the extent of subsurface impacts, if necessary. The boreholes will be advanced to ground water or the apparent extent of degradation based on field screening.

Prior to drilling, local utility companies and S-K personnel will be contacted to locate underground lines in the vicinity of the proposed boreholes. All downhole drilling equipment will be decontaminated with high-pressure spray prior to constructing each borehole and before the drilling rig leaves the site.

Field Screening Procedures

The boreholes will be drilled using a hollow-stem auger. Soil samples will be collected with a split-spoon sampler at 2.5-foot intervals. A qualified geologist will characterize the soil samples for lithology, texture, color, odor, and staining. An aliquot of soil from each

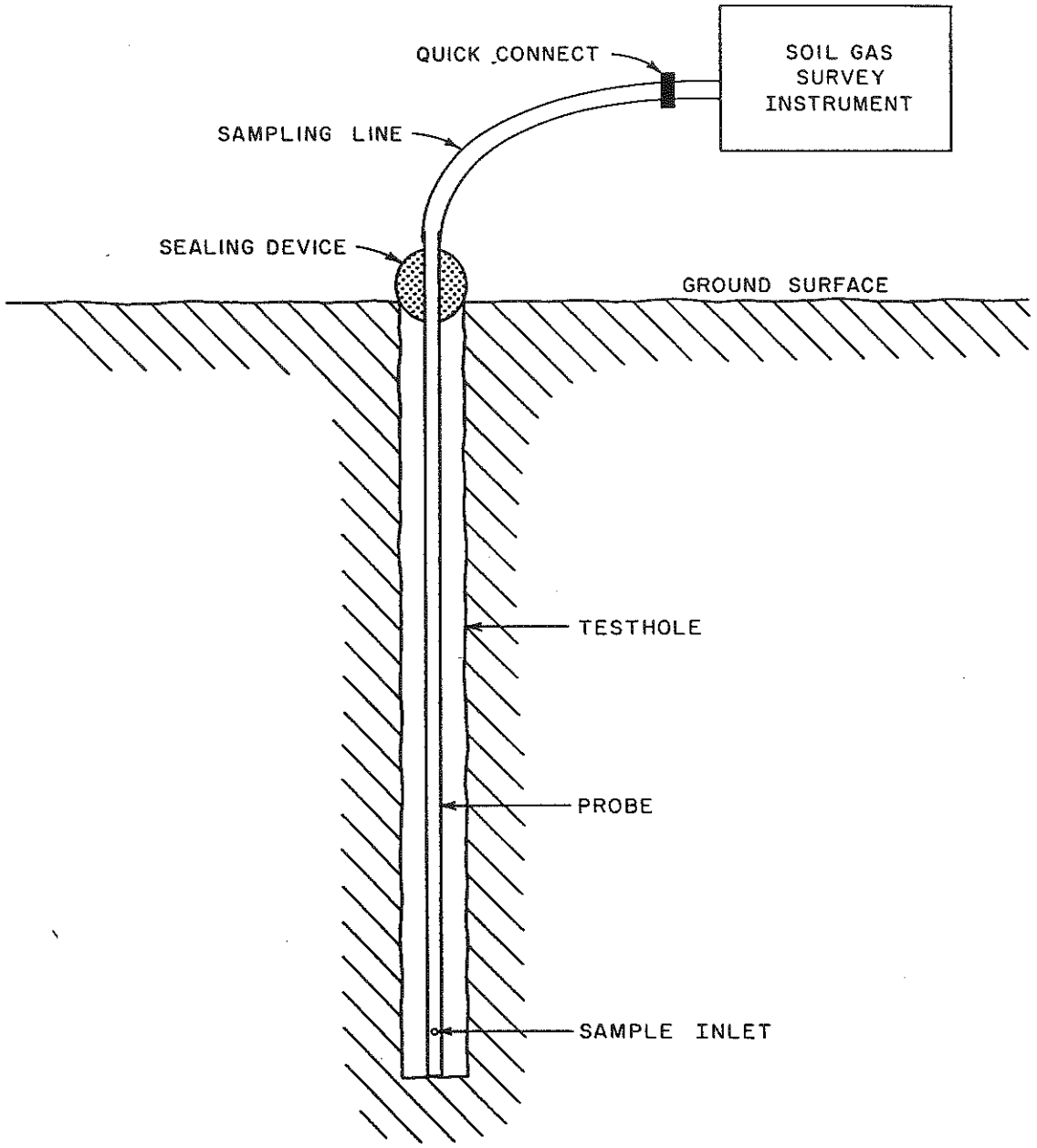


FIGURE 5 : SCHEMATIC DIAGRAM OF SOIL GAS SAMPLING EQUIPMENT, SAFETY-KLEEN CORP. SERVICE CENTER, MOKENA, ILLINOIS

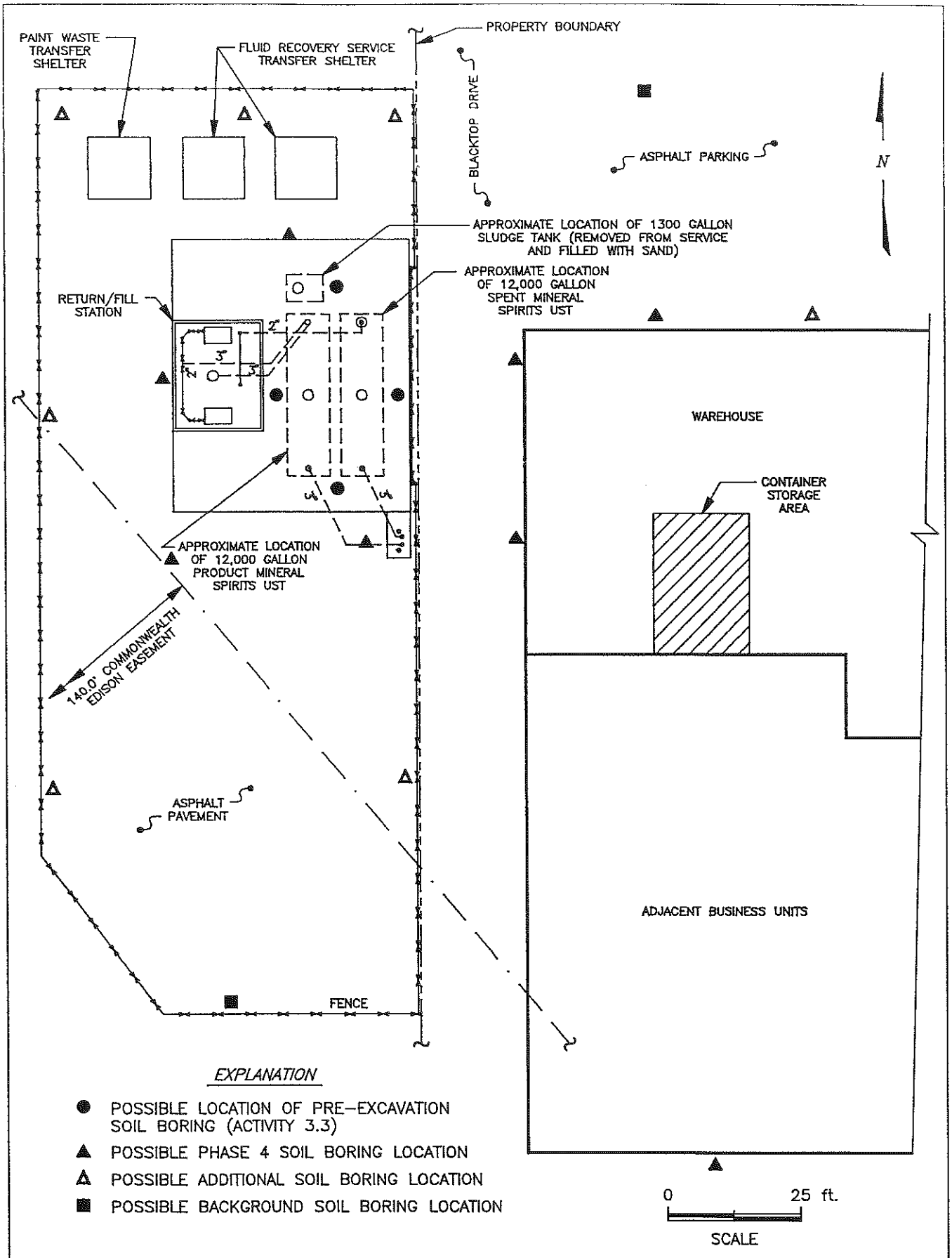


FIGURE 6 :POSSIBLE SOIL BORING/SAMPLING LOCATIONS, FACILITY CLOSURE, SAFETY-KLEEN CORP. SERVICE CENTER, MOKENA, ILLINOIS

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split-spoon sample interval will be sealed in a clean glass or plastic container. The headspace vapors in each sample container will be monitored with a PID. Total organic vapor concentration in the headspace will be measured through a small opening in the lid/seal. This information will be recorded on a log-of-borehole form.

Soil Sample Collection

Up to two undisturbed soil samples will be collected from each borehole for laboratory analysis based on the field screening results. The most degraded soil sample, based on field screening, will be collected from each borehole for laboratory analyses to determine the degree and extent of impacts. A second soil sample will also be collected from each borehole from the deepest interval in which field screening indicates an absence of degradation to define the horizontal and vertical extent of impacts. In addition, samples will be collected from representative/ similar soils to define background conditions.

The samples will be collected in clean brass rings or packed in clean glass jars. The sample containers will be sealed with Teflon sheets and secured with tight-fitting caps. The samples will be labeled, placed on ice in an opaque cooler, and submitted to a laboratory for analysis along with a chain-of-custody/sample-analysis-request form.

Laboratory Analysis

All selected samples will be submitted to a qualified/ certified laboratory for analyses in accordance with USEPA SW-846 methods. The samples collected to determine the extent of soil degradation will be analyzed for the parameters detected during the drum storage area (Activity 2.4) and pre-excavation (Activity 3.3) sampling/analytical programs. Samples collected as part of these programs are to be analyzed for constituents which are characteristic of the materials stored at the site. Samples collected to define the extent of degradation (if present) may be analyzed as follows:

Parameter	USEPA SW-846 Method*
Mineral spirits	Modified 8015
Volatile organic compounds	8240
Semi-volatile organic compounds	8270
Cadmium, chromium, and lead	6010

*USEPA SW-846 "Test Methods for Evaluating Solid Waste"

The background samples will be analyzed for total cadmium, chromium, and lead to characterize naturally occurring conditions in onsite soils. The background soil samples may also be analyzed for mineral spirits, VOCs, SVOCs, if a potential for impacts due to other sources exists or field screening indicates elevated TOV concentrations at background sites.

Management of Auger Cuttings

Soil brought to the surface during drilling is not expected to exhibit characteristics of hazardous waste. Subsequently, the auger cuttings will be handled and disposed in the same manner as the excavated soils (Activity 3.8).

Borehole Sealing and Abandonment

The boreholes will be sealed and abandoned in accordance with the procedures in the latest edition of the Illinois Water Well Construction Code (77 IAC Part 920). The boreholes will be filled from total depth to ground surface with bentonite chips. The bentonite will be hydrated following emplacement. Boreholes penetrating paved surfaces will be capped with asphalt or concrete to match the existing surface.

Activity 4.3 Ground-Water Monitoring Program

S-K will implement a ground-water quality investigation at the site if degradation is documented at the water table, based on the results of the soil boring programs and/or UST removal/excavation sampling activities. S-K proposes to install four monitoring wells: one up-gradient and three immediately down-gradient of the drum storage area, return/fill station, and UST area, as necessary. The exact locations of the monitoring wells will be selected based on the soil boring and soil gas survey results, site accessibility, and regional hydrogeologic information.

The monitoring wells will be installed to allow collection of representative ground-water quality data and determination of ground-water flow. In addition, two representative soil samples will be collected during drilling for laboratory analysis of permeability using a suitable test based on the soil type encountered. Permeability data will be used to estimate migration potential and ground-water flow rates.

Well Siting

Four soil borings will be sited and logged to characterize sediment characteristics and hydrogeology. The actual locations of the monitoring wells will be based on an evaluation of the shallow ground-water flow regime. One up-gradient and three down-gradient boreholes will be completed as monitoring wells to allow representative sampling of the shallow ground water and confirmation of ground-water flow direction underlying the site.

Monitoring Well Completion

The monitoring wells will be designed and constructed in general accordance with specifications contained in the USEPA RCRA Technical Enforcement Guidance Document (TEGD) and the Illinois Water Well Construction Code (77 IAC Part 920). Well Construction Report forms will be filed with the Illinois Department of Public Health following completion of the wells.

The proposed well completion details are shown on Figure 7. The wells will be constructed with four-inch diameter flush-joint, threaded schedule 40 PVC casing and stainless steel screen. Wells will be screened across the water table (if possible) of the uppermost aquifer. Site information indicates that the ground water may fluctuate to within two feet of the surface; therefore, the top of the screen may be slightly below the high water table on a seasonally intermittent basis.

The screen length is expected to be 10 feet to accommodate the natural water level fluctuations. The annular space adjacent to the screen will be packed with appropriately sized silica sand. S-K will attempt to locate the screened interval approximately 70 percent below and 30 percent above the water table, yet maintain an adequate surface seal.

The annular space above the filter pack will be sealed with a minimum one-foot thickness (if possible) of sodium bentonite pellets. As previously mentioned, the top of the screened interval may be as shallow as two feet below ground surface. In no event will the annular bentonite seal be less than one foot thick. The remaining annular space will be filled with concrete. Surface completions will include either a locking steel riser or flush-mount well cover and a concrete pad. Borehole logs, well construction diagrams, and well completion data sheets will be prepared after completion of each well.

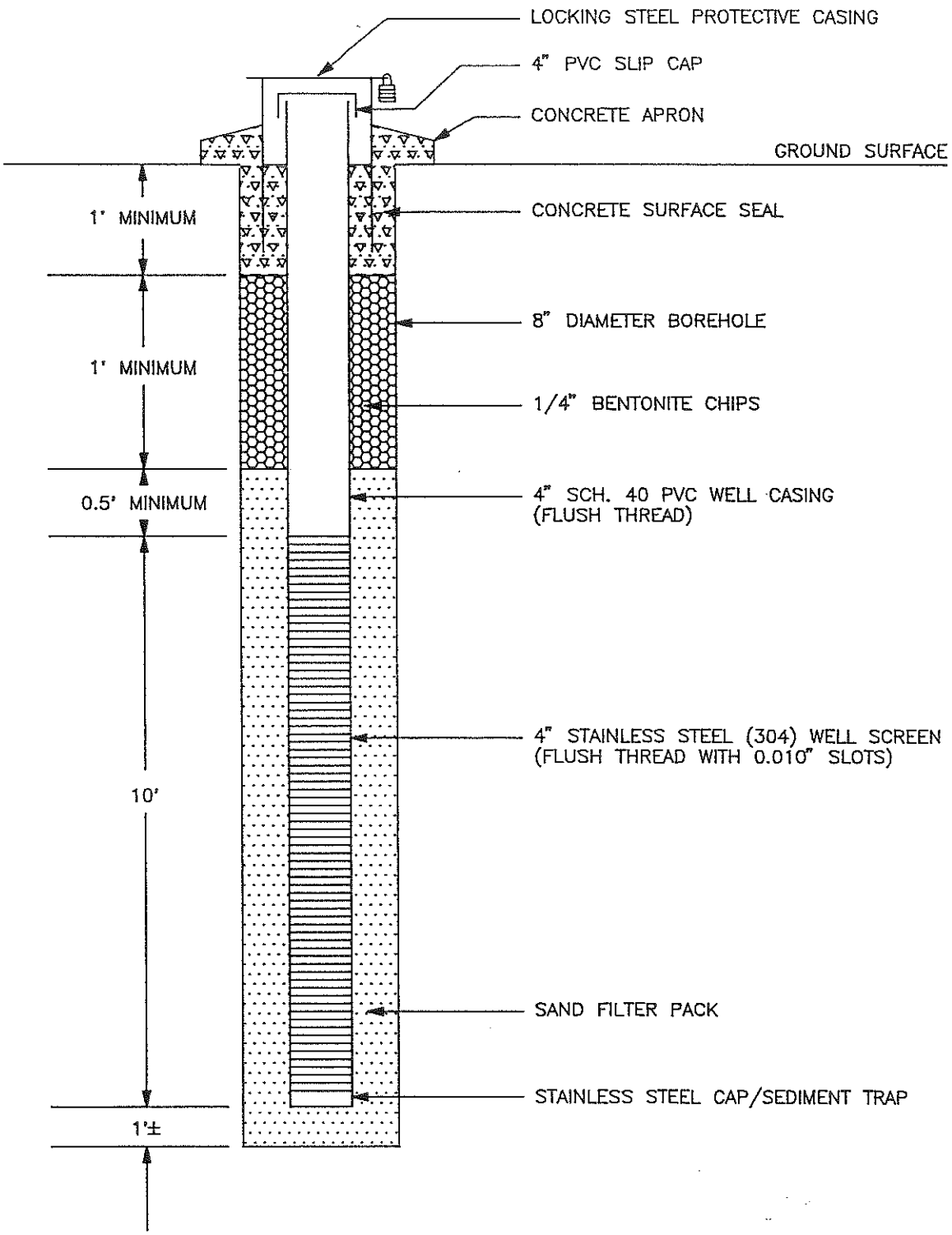

FIGURE 7 :TYPICAL MONITORING WELL COMPLETION DETAIL

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Monitoring Well Development

Development will be conducted until produced water is free of sediment and/or until pH and specific conductance values are stable. An attempt will be made to evacuate at least 10 casing volumes of water using a bailer. If development water is degraded (i.e., oil sheen or PID readings above background), arrangements will be made to containerize the water for disposal through the S-K recycling center. Well development information, including physical characteristics of the ground water, relative recovery rate, volume developed, date, development method, and disposal procedure will be documented on a standard schedule format.

Monitoring Well Surveying

A measuring point will be established and clearly marked at the top of the north side of the well casing. The elevation of the measuring point will be determined relative to mean sea level or other permanent datum and surveyed in to an accuracy of $\pm$0.01 feet. The monitoring well locations and elevations of the water surface will be plotted on an accurate base map so that ground-water flow direction and gradient may be determined.

Sample Collection and Analysis

Ground-water samples will be collected for analysis one to two weeks following well installation and development. Samples will be collected from the monitoring wells in accordance with the procedures discussed in Appendix F. The samples will be analyzed for the parameters detected during the soil sampling/analysis programs. The possible parameters and analytical methods are listed in Table 3.

The wells will be monitored for water levels and water quality. Water levels and hydrocarbon thicknesses, if present, will be measured prior to evacuating the well for sampling. Fluid levels will be measured to a precision of $\pm$0.01 foot using an electronic well probe. Any part of the water level measuring device which contacts the water will be decontaminated and rinsed with distilled water between wells.

Well Preparation. A minimum of three casing volumes will be evacuated from each well prior to collecting water samples. Specific conductance, temperature, and pH

Table 3. Possible Water Quality Monitoring Constituents, Safety-Kleen Corp. Service Center, Mokena, Illinois.

Constituent/Parameter	Analytical Method
Field Parameters	
Temperature	170.1[a]
Specific Conductance	120.1 or 9050[a]
pH	150.1 or 9040[a]
Indicator Parameters[b]	
Mineral Spirits	Modified 8015[c]
Volatile Organic Compounds	8240[c]
Semi-Volatile Organic Compounds	8270[c]
Total Cadmium	6010[c]
Total Lead	7421[c]

Notes:

[a] Reference: Methods for Chemical Analysis of Water and Wastes (EPA-600).

[b] Ground-water samples will be analyzed only for the organic indicator parameters detected during the soil boring program.

[c] Reference: Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (USEPA SW-846).

measurements will be monitored during well preparation to ensure that evacuation procedures produce representative water quality from the shallow aquifer underlying the site.

Ground water will be evacuated from each well using a clean PVC bailer and dedicated polypropylene rope. Prior to use, the PVC bailer will be decontaminated to prevent cross-contamination between wells. The PVC bailers will be thoroughly washed with a water/detergent solution and rinsed with tap water and a final distilled water rinse after each use. If the evacuated water is degraded (i.e., oil sheen or PID readings above background), arrangements will be made to containerize and dispose of the water through the S-K recycling facility.

Sample Collection/Handling. A stainless steel bailer will be used to collect water samples. The rope used to lower the sampling device into each well will be dedicated to that well. The bailer will be cleaned after sample collection at each well. Cleaning procedures will consist of washing the sampling device in a water/detergent solution and rinsing with tap water and a final distilled water rinse.

Water produced from the well will not be unnecessarily agitated during sampling. Water will be transferred directly from the sampling device to the appropriate sample containers, without use of an intermediate transfer container.

Clean sample containers with appropriate preservatives shall be provided by the laboratory. The containers and preservatives will be in accordance with USEPA SW-846 guidance. One set of trip, field, and equipment blanks will be submitted with the samples to the laboratory for quality assurance/quality control (QA/QC).

The sample containers will be labeled and immediately placed into opaque coolers, packed with ice or equivalent. The samples will be shipped within 24 hours to a certified/qualified laboratory for chemical analysis. Chain-of-custody/sample-analysis-request forms will be completed and accompany the samples to the laboratory.

Permeability Determination of Water-Bearing Zone

Two representative soil samples will be collected during drilling of the boreholes for well installation. These samples will be collected in brass rings using a split-spoon sampler. The brass rings will be capped, labeled, and taped and submitted to a qualified laboratory

for analysis of grain size (ASTM D422 test method), liquid-plastic limits (ASTM D4318 test method), and falling head permeability (or other appropriate permeability test based on the soil type encountered).

These analyses will be used to classify the soil types and estimate permeability for those soils. From these laboratory measurements, the permeability, or rate of flow, of the water-bearing zone will be calculated empirically. Permeability will be used to estimate potential migration rates and ground-water flow velocities.

Activity 4.4 Site Assessment Report

S-K will prepare a site assessment report following an evaluation of the soil gas survey data, soil sample analysis results, and ground-water monitoring results. The site assessment results will be evaluated to determine whether S-K has achieved clean closure or whether additional assessment and/or remediation are necessary.

The assessment report will include a description of procedures, sampling locations, and results. The report may also include a closure plan modification for additional assessment work, remedial actions, and/or a health-based risk assessment to document that the facility closure poses no threat to human health and the environment. S-K will submit the assessment report to IEPA within 60 days of receipt of complete and accurate laboratory data. S-K may combine the results of these closure assessment activities with the closure progress report which is described in Activity 3.11.

CHAPTER VII

IMPLEMENT REMEDIAL ACTION (PHASE 5)

S-K will evaluate the results of the closure assessment activities (Phase 4) to determine whether additional assessment and/or remedial action are necessary to achieve clean closure. S-K will also work with IEPA to develop cleanup objectives for soil and/or ground water which are protective of human health and the environment. If the concentrations of facility-related constituents remaining in the soils and ground water are greater than these cleanup levels, S-K will design and implement an appropriate remedial action program (Phase 5), if necessary.

The remedial action program will be designed and implemented following IEPA review and approval of a closure plan modification which describes the proposed activities. However, S-K may elect to implement selected remedial actions prior to formal IEPA approval, in an effort to efficiently achieve clean closure. All remedial actions will be implemented in accordance with applicable regulations and coordinated with IEPA.

Activity 5.1 - Develop Remedial Action Plan

The type of remedial action that will be implemented depends upon the results of the closure assessment activities (i.e., extent and degree of subsurface degradation) and acceptable clean-up objectives. If necessary, S-K will design a remediation program capable of efficiently achieving clean closure. Remediation options that might meet the cleanup objectives include:

1. Excavation and offsite disposal of degraded soils;

2. In-situ remediation of subsurface degradation;

3. Ground-water extraction and treatment; and/or

4. No action option.

Following review of the Phase 4 assessment results, the most appropriate remediation alternative will be selected and S-K will develop a remedial action plan, if necessary. The remedial action plan will include monitor-

ing programs to evaluate the performance of the remedial action. The remedial action plan will be submitted to the IEPA as a modification or amendment to this closure plan.

If an in-situ remedial action is pursued, the time allowed for closure will need to be extended. In such a case, S-K will petition for an extension in accordance with 40 CFR 265.113 to allow more time to achieve clean closure.

Activity 5.2 - Implement Remedial Action

S-K will implement the remedial action plan following IEPA approval. S-K intends to design and implement the most technically feasible remedial action option which will achieve the clean closure to the extent necessary to protect human health and the environment. The remedial action will be designed to address subsurface degradation attributable to the S-K site, if necessary.

Activity 5.3 - Monitor Remediation Progress

S-K will implement a program to monitor the effectiveness of the remedial action. The program will consist of soil sampling and analysis and ground-water monitoring (if necessary). The monitoring programs will be developed in conjunction with the remedial action plan. The monitoring program will also be used to determine when the site has been clean closed and the remedial action program may be terminated.

Activity 5.4 - Prepare Remediation Progress Reports

S-K will prepare periodic Phase 5 progress reports. The report(s) will include a description of the remediation system, field data, laboratory data, and an evaluation of performance. The report(s) will be submitted to IEPA. The frequency of reporting will be discussed in the remedial action plan and will depend on the type of remediation implemented at the site.

CHAPTER VIII

CLOSURE CERTIFICATION REPORT (PHASE 6)

As previously mentioned, S-K is committed to achieving clean closure. Therefore, S-K intends to implement the activities necessary to efficiently achieve and demonstrate clean closure of the drum storage area, USTs, and return/fill station. Closure will be considered complete when one of the following conditions are met:

1. The drum storage area, return/fill station, and USTs have been decontaminated/removed and soil and ground-water quality satisfy the "clean closure" objectives; or

2. The drum storage area, return/fill station, and USTs have been decontaminated/removed and S-K has demonstrated to IEPA that subsurface degradation cannot be remediated within a reasonable closure schedule.

At completion of closure, the engineer will certify that closure has been completed according to the procedures in the approved closure plan. The closure certification will document the procedures used to complete closure and include the data collected to verify the site was clean at closure. Any deviations from the approved closure plan or modifications will be coordinated with IEPA and documented in the closure certification report.

Activity 6.1 - Compile and Evaluate Data

All data and information collected during closure will be compiled, tabulated, and evaluated to document compliance with the closure plan and appropriate regulatory requirements. The evaluation will be performed to document that closure activities satisfactorily addressed the nine closure objectives.

Activity 6.2 - Prepare Closure Certification Report

Upon completion of Activity 6.1, a report will be prepared which summarizes the activities, information,

data, and interpretation that was associated with the closure. The report will be directed toward providing information which documents that the phased activities satisfied the intent and were in accordance with the closure plan. S-K will submit the report to IEPA within 60 days of completion of closure activities.

CHAPTER IX

CLOSURE COST ESTIMATE

Written estimates of closure costs are presented in Appendix G. The closure costs are for closure of the S-K Mokena, Illinois, facility and include the costs associated with closing the drum storage area, return/fill station, 12,000-gallon spent mineral spirits UST, and 1,300-gallon spent mineral spirits sludge UST. The cost estimates are based on the costs for hiring a third party to close the facility as required by 40 CFR 265.142(a)(2).

APPENDIX A

TYPICAL WATER SUPPLY WELL RECORDS

SUMER HEA RO TION, WES
1. DO NOT DE GEOLOGICAL/WATER
PROPER TL AT

GEOLOGICAL AND WATER SURVEYS WELL RECORD

Completed 9/5/75

10. Property owner [redacted] Well No. _____
Address [redacted]
Driller K&K License No. 102-29
11. Permit No. 40776 Date 9/4/75
12. Water from Rock Formation 13. County Will
at depth 64 to 180 ft. Sec. 9
14. Screen: Diam. ___ in. Twp. 35N
Length: ___ ft. Slot _____ Rge. 12E
Elev. _____

SHOW LOCATION IN SECTION PLAT
NW NW NW
(permit)

15. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
5	P.V.C.	0	80

16. Size Hole below casing: 5 in.
17. Static level 64 ft. below casing top which is 2 ft. above ground level. Pumping level 84 ft. when pumping at 20 gpm for 4 hours. Sub. pump set at 84'

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Overburden	0	80
Rock formation	80	180

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Paul Knierim DATE 9/17/75

COUNTY No. 25213.

WILL 9-35N-12E

IMER HEALTH PROTECTION, 535 WEST
, DO NOT ATTACH GEOLOGICAL/WATER
PROPER W. LOCATION.

GEOLOGICAL AND WATER SURVEYS WELL RECORD

Completed 10-20-75

10. Property owner [redacted] Well No. _____
Address [redacted]
Driller K&K License No. 102-29
11. Permit No. 32123 Date 4-21-75
12. Water from Rock Formation 13. County Will
at depth 35 to 160 ft. Sec. 9
14. Screen: Diam. ___ in. Twp. 35N
Length: ___ ft. Slot _____ Rge. 12E
Elev. _____

SHOW LOCATION IN SECTION PLAT
NW SW NW
(permit)

15. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
5	Comp Sch 40	0	80

16. Size Hole below casing: 5 in.
17. Static level 35 ft. below casing top which is 1 ft. above ground level. Pumping level 63 ft. when pumping at 10 gpm for 4 hours. Sub. pump set at 63' Top

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
overburden	0	80
rock formation	80	160

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Paul Knierim DATE 6-19-76

COUNTY No. 25128...

WILL 9-35N-12E

APPENDIX B

DRUM STORAGE AREA LETTER REPORT
CONTAINMENT TRENCH ASSESSMENT
AUGUST 1991

August 1991 91-194-04

LETTER REPORT
SOIL SAMPLING AND ANALYSIS
MOKENA, ILLINOIS

CanonieEnvironmental

Canonie Environmental Services Corp.
800 Canonie Drive
Porter, Indiana 46304
Phone: 219-926-8651
Fax: 219-926-7169

91-194-04

August 15, 1991

Mr. Scott Davies
Senior Project Engineer - Remediation
Safety-Kleen Corp.
777 Big Timber Road
Elgin, IL 60123

Letter Report
Soil Sampling and Analysis
Mokena, Illinois

Dear Mr. Davies:

This report is an account of the sampling performed at the Safety-Kleen Corporation (Safety-Kleen) Mokena, Illinois Facility. The work was performed under Authorization Number 06269101 and as proposed in Canonie Environmental Services Corp.'s (Canonie's) letter dated June 25, 1991.

Field Work

The purpose of this investigation was to collect soil samples from the unlined containment trench. These samples were to be submitted for total petroleum hydrocarbon and volatile organic compound (VOC) analysis, and the results were to be reported to Safety-Kleen.

A Canonie engineer mobilized June 27, 1991 to complete the sampling program. Samples were obtained from two areas within the facility as requested by the plant manager, not one as originally described to Canonie by Scott Davies. Soil samples were obtained using a hand auger from within the two containment trenches shown in the Appendix A field notes.

The unprotected (nonconcreted) soils are located at the southern ends of the two trenches. These soils were sampled at depths of 0 to 12 inches and 12 to 24 inches. The proposed sampling scheme was to sample at 24 to 36 inches, in addition to the shallower depths; however, only sufficient bottles (six, total) were ordered for one location as per the original proposal. In order to sample the two areas as requested, it was

necessary to sample Area A1 (eastern trench) to 12 inches then Area A2 (western trench) at 0 to 12 and 12 to 24 inches. Therefore, no containers were available for the 24- to 36-inch sample.

Procedure

The sampling procedure is outlined below.

1. Surficial (less than 1/8 inch) deposits were scraped away from the sample location.

2. A decontaminated hand auger was used to auger from the surface to the required depth.

3. The hand auger was removed, and the soils contained in the auger bucket were transferred to a clean stainless-steel mixing bowl and homogenized to break up the clay lumps.

4. The soils were then immediately transferred into two sample jars. The smaller (0.5-liter) jar had a Teflon™ seal and was submitted for VOC analysis. The larger (0.75-liter) jar also had a Teflon™ seal and was submitted for mineral spirits analysis.

5. The hand auger was decontaminated between sample depths to avoid cross-contamination of samples. Decontamination was achieved using an Alconox™ soap wash, clean water rinse, and a final distilled/deionized (DI) water rinse. A sample of the DI water was retained for analysis for quality assurance (QA) purposes.

Using the above procedure, samples were obtained from the two containment trenches. Table 1 is a sample summary list and also shows the analysis methods requested for each sample. A total of six soil samples were submitted for analysis (3x Method 8015, 3x Method 8240), and two field blanks were submitted for QA purposes.

Results Summary and Analysis

The soils in the eastern trench are very clayey and relatively firm. The soils had no noticeable staining or odors.

The western trench soils have a higher moisture content than the eastern trench soils. The plant manager indicated that water from an eye-wash station often drains into the western trench. Surficial soils in this trench are darker than the subsurface soils. The surficial soils consist of a firm clay with a 15- to 20-percent moisture content. Below 12 inches, the soils are softer with more silt.

Analytical results indicate that impacts exist in both Areas A1 and A2. Table 2 contains a list of compounds which exceed their respective reporting limits. Impacts in Area A1 are limited to methylene chloride, acetone, and tetrachloroethane. Impacts in Area A2 are more extensive.

Area A2 contains 31,000 to 37,000 µg/kg of tetrachloroethane, which is the largest impact. The impacts listed in Table 2 for Area A2 can be divided by depth. Five of the detected compounds increase in concentrations as depth increases, and the other compounds decrease in concentration with depth. The compounds are listed below:

Decrease with Depth	Increase with Depth
Acetone	Methylene Chloride
Toluene	Tetrachloroethane
Chlorobenzene	1,2-Dichloroethane (Total)
Ethylbenzene	2-Butanone
Xylene	Trichloroethane
4-Methyl-2-Pentanone	

The fact that some compounds are increasing with depth indicates that either an old spill is traveling downwards through the soils or that there is a separate source for the compounds that increase with depth.

The low levels of impacts found in the eastern trench can probably be safely covered with concrete when the containment trench is relined. The higher impact levels found in the western trench indicate the need to excavate the impacted soils for disposal. This soil removal should continue to a depth of at least three feet (or to ground water). Safety-Kleen may wish to take a confirmatory analytical sample from the base of the excavated soils. The excavation could be backfilled with clean materials prior to relining the trench.

As the leaking eye-wash station is a possible transport mechanism carrying impacts from the floor into the trench, the leak should be repaired as soon as possible.

The engineer field notes are contained in Appendix A, and the laboratory report is contained in Appendix B. Table 1 summarizes the samples taken at the site, and Table 2 presents a summary of the analytical data.

Very truly yours,

Paul W. Lambert

Paul W. Lambert, CPG
Project Manager

PWL/tl

Attachments

LIST OF TABLES

LIST OF APPENDICES

TABLE 1

SAMPLE SUMMARY TABLE
MOKENA, ILLINOIS

Sample Designation	Depth	Matrix	Analysis Requested 8015 (MOD)	8240 (VOA)
A1-1	0-12"	Soil		X
A1-2	0-12"	Soil	X	
A2-1	0-12"	Soil		X
A2-2	0-12"	Soil	X	
A2-3	12-24"	Soil	X	
A2-4	12-24"	Soil		X
RB-1	NA	Water	X	
RB-2	NA	Water		X
Trip Blank	NA	Water	X	
Trip Blank	NA	Water		X

TABLE 2

VOLATILES EXCEEDING REPORTING LIMITS

		Sample Identification								
Test Method	Volatile Compound	A1-1 (ug/kg)	A1-2 (ug/kg)	A2-1 (ug/kg)	A2-2 (mg/kg)	A2-3 (mg/kg)	A2-4 (ug/kg)	RB-1 (mg/l)	RB-2 (ug/l)	TRIP BLANK (ug/l)
8240	Methylene Chloride	8		92			280		7	BDL
8240	Acetone	210		820			700		BDL	BDL
8240	Tetrachloroethane	33		*31,000			*37,000		BDL	BDL
8240	Toluene	BDL		30			18		BDL	BDL
8240	1,2-Dichloroethene (total)	BDL		9			90		BDL	BDL
8240	2-Butanone	BDL		520			990		BDL	BDL
8240	Trichloroethane	BDL		56			220		BDL	BDL
8240	Chlorobenzene	BDL		27			7		BDL	BDL
8240	Ethylbenzene	BDL		190			45		BDL	BDL
8240	Xylene (total)	BDL		530			110		BDL	BDL
8240	4-Methyl-2-pentanone	BDL		*1800			370		BDL	BDL
8015	Mineral Spirits		BDL		BDL	BDL		BDL		
	Percentage Solids	79.6		83.5			81.0			

*Indicates the sample needed to be diluted.

BDL Below Detection Limits

APPENDIX A

ENGINEER'S FIELD NOTES

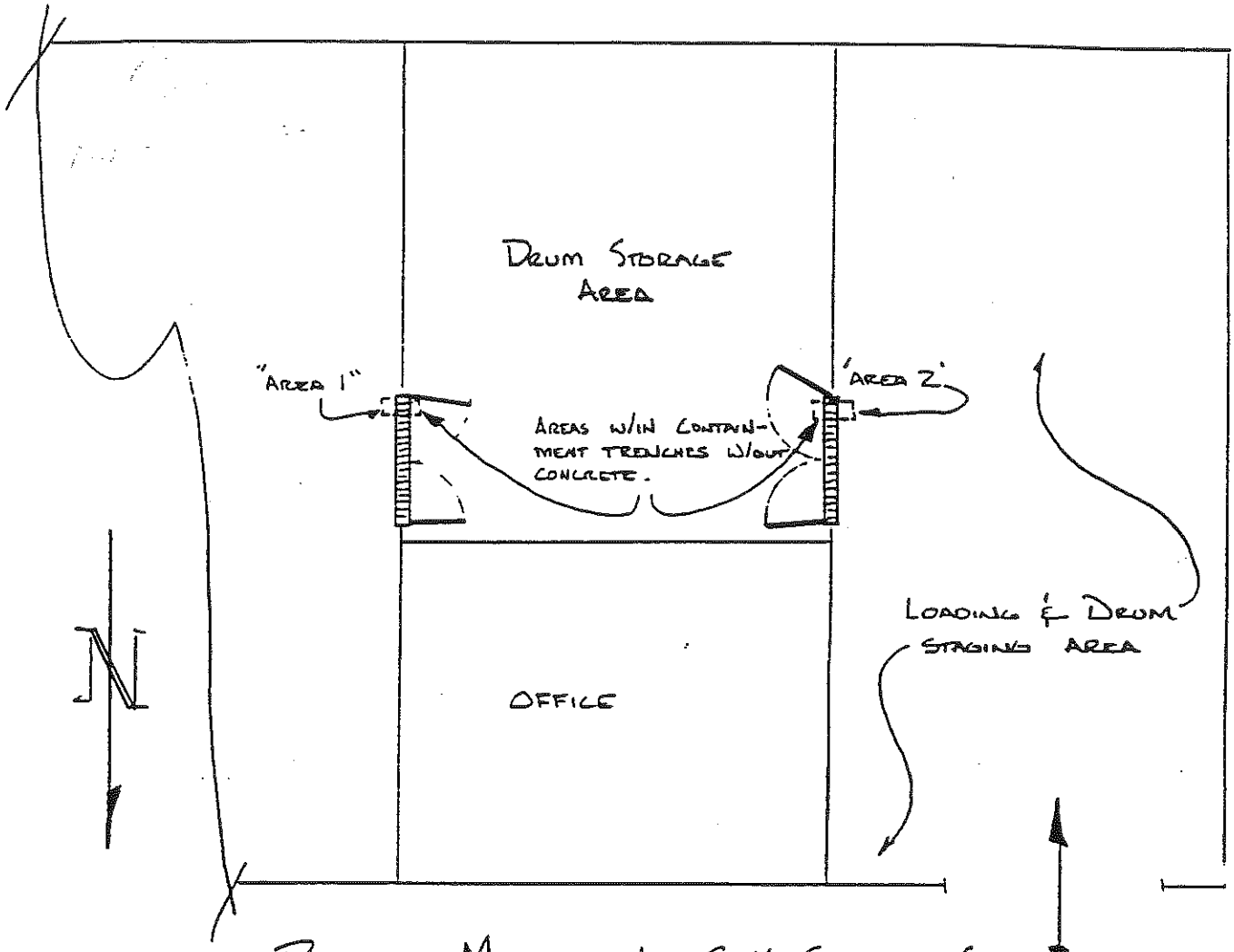
Canonie

1

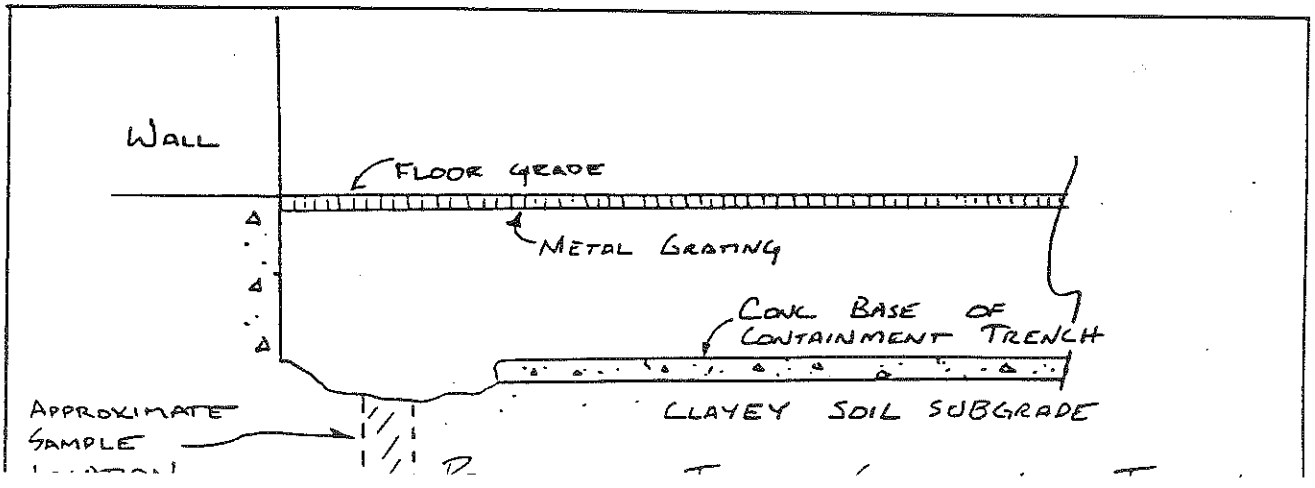
by KRH Date 6/27/91 Subject Mokena, IL Safety-Kleen Sheet No. 1 of 2

Chkd. By ____ Date ____ Exploratory Soil Sampling Proj. No. 91-194-04

1/4" X 1/4"



Plan of Mokena, IL S-K Service Cntr.
(Not to scale)



Canonie

By KRH Date 6/27/91 Subject MOKENA, IL SAFETY-KLEEN Sheet No. 2 of 2

Chkd. By ____ Date ____ EXPLORATORY SOIL SAMPLING Proj. No. 91-194-04

1/4" X 1/4"

'AREA 1'

THIS AREA, DESIGNATED AS THE EASTERN TRENCH AREA W/OUT CONCRETE, HAD NO NOTICABLE STAINS OR ODORS. SOILS WERE SAMPLED FROM THE 0"-12" INTERVAL. THEIR SOILS WERE VERY CLAYEY AND RELATIVELY FIRM. MOISTURE CONTENT ~ 15-20%.

SAMPLE I.D.	LOCATION DESCRIPTION & ANALYSIS
A1-1	0"-12" INTERVAL, VOLATILE ORGANICS ANAL.
A1-2	0"-12" INTERVAL, MINERAL SPIRITS ANAL.

'AREA 2'

THE WESTERN TRENCH AREA W/OUT CONCRETE WAS DESIGNATED AS AREA 2. THE MANAGER OF THE FACILITY INDICATED THAT OFTEN WATER FROM A NEARBY EYE-WASH DRAINED INTO THIS CONTAINMENT TRENCH. VISIBLE MOISTURE WAS NOTED IN THE SOIL. SURFACE SOILS WERE MUCH DARKER AND SOFTER THAN SUBSURFACE SOILS. SAMPLES WERE TAKEN FROM 0"-12" AND 12"-24" INTERVALS. SOILS FROM 12"-24" WERE VERY FIRM $_{CL}^{CLAY}$ W_c ~ 15-20%; SOILS FROM 0"-12" WERE SOFTER SILTY CLAY W/ HIGHER W_c.

SAMPLE I.D.	LOCATION DESCRIPTION & ANALYSIS
A2-1	0"-12" INTERVAL, VOLATILE ORGANICS ANAL.
A2-2	0"-12" INTERVAL, MINERAL SPIRITS ANAL.
A2-3	12"-24" INTERVAL, MINERAL SPIRITS ANAL.
A2-4	12"-24" INTERVAL, VOLATILE ORGANICS ANAL.
RB-1	RINSE BLANK PRIOR TO TAKING A2-3 & -4 FOR MINERAL SPIRITS ANALYSIS
RB-2	RINSE BLANK PRIOR TO TAKING A2-3 & -4 FOR VOLATILE ORGANICS ANALYSIS

APPENDIX B

ANALYTICAL RESULTS

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Tuesday July 9th, 1991

RE: A1-1
Project # 0000-00-00-0000
Lab ID: 9106G072-005
Sample Date: 06/27/91
Date Received: 06/27/91

Inorganic Client Data Report

Parameters	Result	Units	Reporting Limit
% Solids	79.6	%	0.10

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Tuesday July 9th, 1991

RE: A2-1
Project # 0000-00-00-0000
Lab ID: 9106G072-006
Sample Date: 06/27/91
Date Received: 06/27/91

Inorganic Client Data Report

Parameters	Result	Units	Reporting Limit
% Solids	83.5	%	0.10

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Tuesday July 9th, 1991

RE: A2-4
Project # 0000-00-00-0000
Lab ID: 9106G072-007
Sample Date: 06/27/91
Date Received: 06/27/91

Inorganic Client Data Report

Parameters	Result	Units	Reporting Limit
% Solids	81.0	%	0.10

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Tuesday July 9th, 1991

Project # 0000-00-00-0000
Lab Batch: 9106G072

Inorganic Method Blank Data Report

Sample	Lab ID	Parameter	Result		Units	Reporting Limit
Blank 1	91GTS261-MB1	% Solids	0.10	u	%	0.10

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A1-1
Project # 0000-00-00-0000
Lab ID: 9106G072-005
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
Chloromethane	BDL	13	U
Bromomethane	BDL	13	U
Vinyl Chloride	BDL	13	U
Chloroethane	BDL	13	U
Methylene Chloride	8	6	
Acetone	210	13	
Carbon Disulfide	BDL	6	U
1,1-Dichloroethene	BDL	6	U
1,1-Dichloroethane	BDL	6	U
1,2-Dichloroethene (total)	BDL	6	U
Chloroform	BDL	6	U
1,2-Dichloroethane	BDL	6	U
2-Butanone	BDL	13	U
1,1,1-Trichloroethane	BDL	6	U
Carbon Tetrachloride	BDL	6	U
Vinyl Acetate	BDL	13	U
Bromodichloromethane	BDL	6	U

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To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A1-1
Project # 0000-00-00-0000
Lab ID: 9106G072-005
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
1,2-Dichloropropane	BDL	6	U
cis-1,3-Dichloropropene	BDL	6	U
Trichloroethene	BDL	6	U
Dibromochloromethane	BDL	6	U
1,1,2-Trichloroethane	BDL	6	U
Benzene	BDL	6	U
Trans-1,3-Dichloropropene	BDL	6	U
Bromoform	BDL	6	U
4-Methyl-2-pentanone	BDL	13	U
2-Hexanone	BDL	13	U
Tetrachloroethene	33	6	
1,1,2,2-Tetrachloroethane	BDL	6	U
Toluene	4	6	J
Chlorobenzene	BDL	6	U
Ethylbenzene	BDL	6	U
Styrene	BDL	6	U
Xylene (total)	BDL	6	U

WESTON-GULF COAST LABORATORIES, INC.
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ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A1-1
Project # 0000-00-00-0000
Lab ID: 9106G072-005
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

Tentatively Identified Compounds

No Volatile Compounds greater than 10% of the nearest internal standard were tentatively identified by mass spectral library search. This is exclusive of any target compounds, surrogates or internal standards.

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-1
Project # 0000-00-00-0000
Lab ID: 9106G072-006
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
Chloromethane	BDL	12	U
Bromomethane	BDL	12	U
Vinyl Chloride	BDL	12	U
Chloroethane	BDL	12	U
Methylene Chloride	92	6	
Acetone	820	12	
Carbon Disulfide	BDL	6	U
1,1-Dichloroethene	BDL	6	U
1,1-Dichloroethane	BDL	6	U
1,2-Dichloroethene (total)	9	6	
Chloroform	BDL	6	U
1,2-Dichloroethane	BDL	6	U
2-Butanone	520	12	
1,1,1-Trichloroethane	BDL	6	U
Carbon Tetrachloride	BDL	6	U
Vinyl Acetate	BDL	12	U
Bromodichloromethane	BDL	6	U

WESTON-GULF COAST LABORATORIES, INC.
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ANALYTICAL REPORT

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800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-1
Project # 0000-00-00-0000
Lab ID: 9106G072-006
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
1,2-Dichloropropane	BDL	6	U
cis-1,3-Dichloropropene	BDL	6	U
Trichloroethene	56	6	
Dibromochloromethane	BDL	6	U
1,1,2-Trichloroethane	BDL	6	U
Benzene	BDL	6	U
Trans-1,3-Dichloropropene	BDL	6	U
Bromoform	BDL	6	U
4-Methyl-2-pentanone	E	12	
2-Hexanone	BDL	12	U
Tetrachloroethene	E	6	
1,1,2,2-Tetrachloroethane	BDL	6	U
Toluene	30	6	
Chlorobenzene	27	6	
Ethylbenzene	190	6	
Styrene	BDL	6	U
Xylene (total)	530	6	

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-1
Project # 0000-00-00-0000
Lab ID: 9106G072-006
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

Tentatively Identified Compounds

9 Volatile Compounds greater than 10% of the nearest internal standard were tentatively identified by mass spectral library search. This is exclusive of any target compounds, surrogates or internal standards.

Volatile Compound	Retention Time	Estimated Concentration	
UNKNOWN C4H8O	11.52	100	J
Unknown	14.46	300	J
Unknown	20.91	200	J
Unknown hydrocarbon C8H16	24.06	200	J
Unknown	25.12	1000	J
Unknown hydrocarbon C9H18	27.04	70	J
Subst. cyclic hydrocarbon	25.66	80	J
Subst. cyclic hydrocarbon	27.94	200	J
Subst. cyclic hydrocarbon	28.85	70	J

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-1
Project # 0000-00-00-0000
Lab ID: 9106G072-006 DL
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
4-Methyl-2-pentanone	1800	1200	
Tetrachloroethene	31000	600	

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-4
Project # 0000-00-00-0000
Lab ID: 9106G072-007
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
Chloromethane	BDL	12	U
Bromomethane	BDL	12	U
Vinyl Chloride	BDL	12	U
Chloroethane	BDL	12	U
Methylene Chloride	280	6	
Acetone	700	12	
Carbon Disulfide	BDL	6	U
1,1-Dichloroethene	BDL	6	U
1,1-Dichloroethane	BDL	6	U
1,2-Dichloroethene (total)	90	6	
Chloroform	BDL	6	U
1,2-Dichloroethane	BDL	6	U
2-Butanone	990	12	
1,1,1-Trichloroethane	BDL	6	U
Carbon Tetrachloride	BDL	6	U
Vinyl Acetate	BDL	12	U
Bromodichloromethane	BDL	6	U

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ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-4
Project # 0000-00-00-0000
Lab ID: 9106G072-007
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
1,2-Dichloropropane	BDL	6	U
cis-1,3-Dichloropropene	BDL	6	U
Trichloroethene	220	6	
Dibromochloromethane	BDL	6	U
1,1,2-Trichloroethane	BDL	6	U
Benzene	BDL	6	U
Trans-1,3-Dichloropropene	BDL	6	U
Bromoform	BDL	6	U
4-Methyl-2-pentanone	370	12	
2-Hexanone	BDL	12	U
Tetrachloroethene	E	6	
1,1,2,2-Tetrachloroethane	BDL	6	U
Toluene	18	6	
Chlorobenzene	7	6	
Ethylbenzene	45	6	
Styrene	BDL	6	U
Xylene (total)	110	6	

WESTON-GULF COAST LABORATORIES, INC.
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To: Canonie Environmental
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Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-4
Project # 0000-00-00-0000
Lab ID: 9106G072-007
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

Tentatively Identified Compounds

1 Volatile Compounds greater than 10% of the nearest internal standard were tentatively identified by mass spectral library search. This is exclusive of any target compounds, surrogates or internal standards.

Volatile Compound	Retention Time	Estimated Concentration
Unknown	25.16	40 J

WESTON-GULF COAST LABORATORIES, INC.
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ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: A2-4
Project # 0000-00-00-0000
Lab ID: 9106G072-007 DL
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/KG

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
Tetrachloroethene	37000	620	

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: RB-2
Project # 0000-00-00-0000
Lab ID: 9106G072-008
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/L

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
Chloromethane	BDL	10	U
Bromomethane	BDL	10	U
Vinyl Chloride	BDL	10	U
Chloroethane	BDL	10	U
Methylene Chloride	7	5	B
Acetone	BDL	10	U
Carbon Disulfide	BDL	5	U
1,1-Dichloroethene	BDL	5	U
1,1-Dichloroethane	BDL	5	U
1,2-Dichloroethene (total)	BDL	5	U
Chloroform	BDL	5	U
1,2-Dichloroethane	BDL	5	U
2-Butanone	BDL	10	U
1,1,1-Trichloroethane	BDL	5	U
Carbon Tetrachloride	BDL	5	U
Vinyl Acetate	BDL	10	U
Bromodichloromethane	BDL	5	U

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: RB-2
Project # 0000-00-00-0000
Lab ID: 9106G072-008
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/L

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
1,2-Dichloropropane	BDL	5	U
cis-1,3-Dichloropropene	BDL	5	U
Trichloroethene	BDL	5	U
Dibromochloromethane	BDL	5	U
1,1,2-Trichloroethane	BDL	5	U
Benzene	BDL	5	U
Trans-1,3-Dichloropropene	BDL	5	U
Bromoform	BDL	5	U
4-Methyl-2-pentanone	BDL	10	U
2-Hexanone	BDL	10	U
Tetrachloroethene	4	5	J
1,1,2,2-Tetrachloroethane	BDL	5	U
Toluene	BDL	5	U
Chlorobenzene	BDL	5	U
Ethylbenzene	BDL	5	U
Styrene	BDL	5	U
Xylene (total)	BDL	5	U

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Date: Thursday July 25th, 1991

RE: RB-2
Project # 0000-00-00-0000
Lab ID: 9106G072-008
Sample Date: 06/27/91
Date Received: 06/27/91
Units: UG/L

Tentatively Identified Compounds

No Volatile Compounds greater than 10% of the nearest internal standard were tentatively identified by mass spectral library search. This is exclusive of any target compounds, surrogates or internal standards.

WESTON-GULF COAST LABORATORIES, INC.
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ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: Trip Blank
Project # 0000-00-00-0000
Lab ID: 9106G072-009
Sample Date: 06/26/91
Date Received: 06/27/91
Units: UG/L

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
Chloromethane	BDL	10	U
Bromomethane	BDL	10	U
Vinyl Chloride	BDL	10	U
Chloroethane	BDL	10	U
Methylene Chloride	4	5	JB
Acetone	BDL	10	U
Carbon Disulfide	BDL	5	U
1,1-Dichloroethene	BDL	5	U
1,1-Dichloroethane	BDL	5	U
1,2-Dichloroethene (total)	BDL	5	U
Chloroform	BDL	5	U
1,2-Dichloroethane	BDL	5	U
2-Butanone	BDL	10	U
1,1,1-Trichloroethane	BDL	5	U
Carbon Tetrachloride	BDL	5	U
Vinyl Acetate	BDL	10	U
Bromodichloromethane	BDL	5	U

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Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
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Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: Trip Blank
Project # 0000-00-00-0000
Lab ID: 9106G072-009
Sample Date: 06/26/91
Date Received: 06/27/91
Units: UG/L

VOLATILES BY GC/MS, HSL LIST

Volatile Compound	Result	Reporting Limit	Flag
1,2-Dichloropropane	BDL	5	U
cis-1,3-Dichloropropene	BDL	5	U
Trichloroethene	BDL	5	U
Dibromochloromethane	BDL	5	U
1,1,2-Trichloroethane	BDL	5	U
Benzene	BDL	5	U
Trans-1,3-Dichloropropene	BDL	5	U
Bromoform	BDL	5	U
4-Methyl-2-pentanone	BDL	10	U
2-Hexanone	BDL	10	U
Tetrachloroethene	BDL	5	U
1,1,2,2-Tetrachloroethane	BDL	5	U
Toluene	BDL	5	U
Chlorobenzene	BDL	5	U
Ethylbenzene	BDL	5	U
Styrene	BDL	5	U
Xylene (total)	BDL	5	U

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ANALYTICAL REPORT

To: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: Thursday July 25th, 1991

RE: Trip Blank
Project # 0000-00-00-0000
Lab ID: 9106G072-009
Sample Date: 06/26/91
Date Received: 06/27/91
Units: UG/L

Tentatively Identified Compounds

No Volatile Compounds greater than 10% of the nearest internal standard were tentatively identified by mass spectral library search. This is exclusive of any target compounds, surrogates or internal standards.

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2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: July 22, 1991

Re: A1-2
Project # 3318-01-01-0000
Lab ID: 9106G072-001
Sample Date: 06/27/91
Date Received: 06/27/91
Units: mg/kg

ORGANIC CLIENT DATA REPORT

Compound	Result	Detection Limit	Flag
Mineral Spirits	BDL	1.2	U

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: July 22, 1991

Re: A2-2
Project # 3318-01-01-0000
Lab ID: 9106G072-002
Sample Date: 06/27/91
Date Received: 06/27/91
Units: mg/kg

ORGANIC CLIENT DATA REPORT

Compound	Result	Detection Limit	Flag
Mineral Spirits	BDL	1.2	U

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: July 22, 1991

Re: A2-3
Project # 3318-01-01-0000
Lab ID: 9106G072-003
Sample Date: 06/27/91
Date Received: 06/27/91
Units: mg/kg

ORGANIC CLIENT DATA REPORT

Compound	Result	Detection Limit	Flag
Mineral Spirits	BDL	1.2	U

WESTON-GULF COAST LABORATORIES, INC.
2417 Bond St., University Park, Illinois 60466
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Environmental
800 Canonie Drive
Porter Drive
Porter, IN 46304

Attn: Mr. Terry Ashworth

Date: July 22, 1991

Re: RB-1
Project # 3318-01-01-0000
Lab ID: 9106G072-004
Sample Date: 06/27/91
Date Received: 06/27/91
Units: mg/L

ORGANIC CLIENT DATA REPORT

Compound	Result	Detection Limit	Flag
Mineral Spirits	BDL	0.050	U

APPENDIX C

JANUARY 23, 1992, LETTER TO IEPA
REPAIR OF SECONDARY CONTAINMENT TRENCHES
DRUM STORAGE AREA

Mokena, IL

safety-kleen.

Certified Mail - Return Receipt Requested

January 23, 1992

Mr. Doug Clay
Division of Land Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Subject: Mokena Service Center
Repair of Secondary Containment Trenches in Container Storage Area

Dear Mr. Clay,

This letter has been prepared to transmit a soil sampling and analysis report and a certification of repair for the subject trenches. As Mr. Bruce White, our legal counsel, discussed with you last summer, repairs of the trenches in the Mokena facility's drum storage area were needed; however, contamination is present in the general area of the trenches. As Mr. White stated, Safety-Kleen believed the best course of action was to repair the trenches and then remediate the contamination site-wide through the corrective action component of the Part B permit.

The enclosed certification describes the procedure for repairing the trenches and the inspection procedures to insure the integrity of the repairs.

Please review the enclosed documents and indicate whether the repairs and certification meet with the Agency's approval. If you have any questions or require additional information, please contact Cindy Tarka, the new regional environmental engineer for the Chicago service centers, on extension 2550 or me on extension 2246.

Sincerely,

Ellen J. Jurczak
Environmental Affairs Manager
Central Division

777 BIG TIMBER ROAD ELGIN, ILLINOIS 60123 PHONE 708/697-8460 FAX 708/697-4295

bcc: C. Tarka
P. Jefferson
Mokena Br. Mgr.
K. Schmuggerow
S. Davies
B. White
Branch File

APPENDIX D

CONTAINER STORAGE AREA
CONTAINMENT TRENCH CERTIFICATION
DRUM STORAGE AREA
DECEMBER 16, 1991

CONTAINER STORAGE AREA
CONTAINMENT TRENCH CERTIFICATION
SAFETY-KLEEN CORPORATION BRANCH
MOKENA, ILLINOIS

Facility No. 5-034-05

Prepared by:

QuesTec Corporation
4812 Santana Circle
Columbia, Missouri 65203
Project No. 9142.2

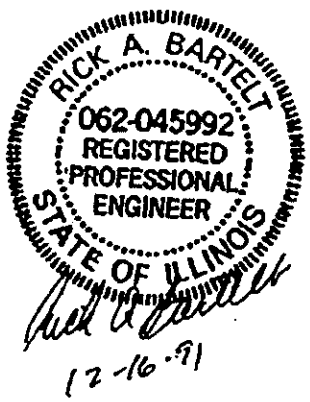
December 16, 1991

CONTAINMENT CERTIFICATION

I have supervised the containment trench assessment dated December 16, 1991 at the Safety-Kleen Corporation facility in Mokena, Illinois.

With regard to this duty, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Rick A. Bartelt
Registered Professional Engineer
Illinois Registration Number 062-045992
QuesTec Corporation
4812 Santana Circle
Columbia, Missouri 65203



SYSTEM DESCRIPTION

The Safety-Kleen Service Center in Mokena, Illinois has a drum storage area with two concrete containment trenches, 5'-2" long, 1'-0" wide and 2'-0" deep. Each trench had a portion of the bottom that was gravel. One of the trenches has a 5" diameter sewer line running diagonally through the trench. The pipe had been abandoned and had been cemented at both ends. See attached drawings.

REPAIR PROCEDURE

The gravel portion of the trench was replaced with concrete. The trench was coated with an epoxy coating after the concrete had cured. See attached sketch.

TRENCH INSPECTION

The trenches were visually inspected for cracks, gaps or any potential leakage point. The trenches were subjected to a 24 hour water tightness test to verify that they are sufficiently impervious to contain leaks and spills until the collected material is detected and removed. The test procedure was simply to fill the trench to the top with water, note the liquid level, then reinspect after 24 hours to determine if the level had changed. The inspections were to determine if the trenches meet the requirements of 40 CFR 264.175(b)(1).

Four site inspections were made by QuesTec representative Mark Bornhoft.

First Inspection: November 25, 1991

Both trenches were inspected for cracks, gaps, or other defects. None were found. Both trenches had fresh coats of epoxy coating. They were both filled with water.

Second inspection: November 26, 1991

Water levels in both trenches were checked. The trench with the sewer pipe had lost about 3/4" of water. At one end of the pipe where the end had been cemented, the floor was sweating, possibly indicating that the water had somehow leaked into the pipe. The other trench had not lost any water and thus had successfully passed the test.

Third inspection: December 6, 1991

Between the second and third inspections the pipe had been recoated with epoxy. The trench was filled with water to conduct a second test.

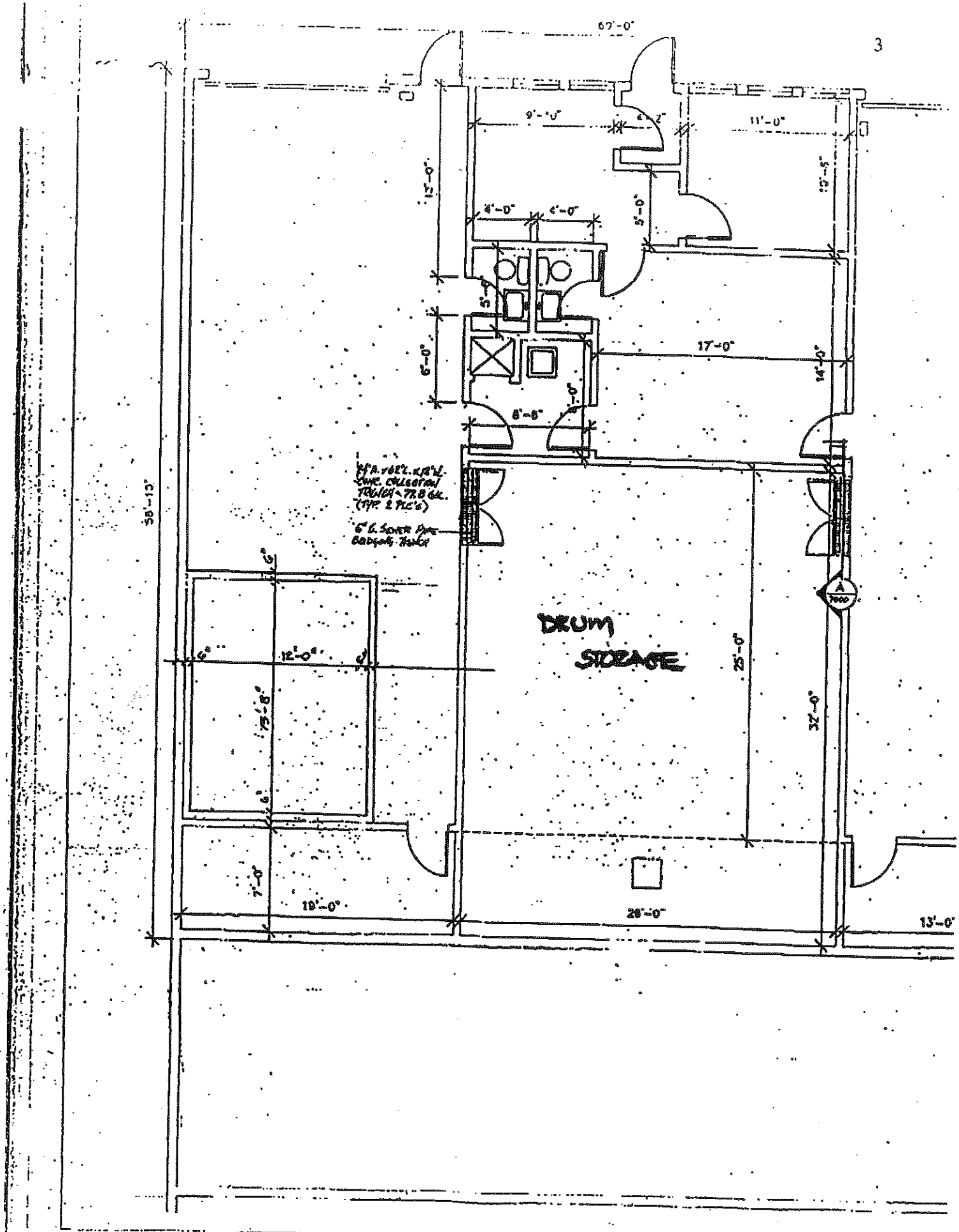
Fourth inspection: December 7, 1991

The water level in the trench had not changed in 24 hours. It was concluded that the trench passed the test.

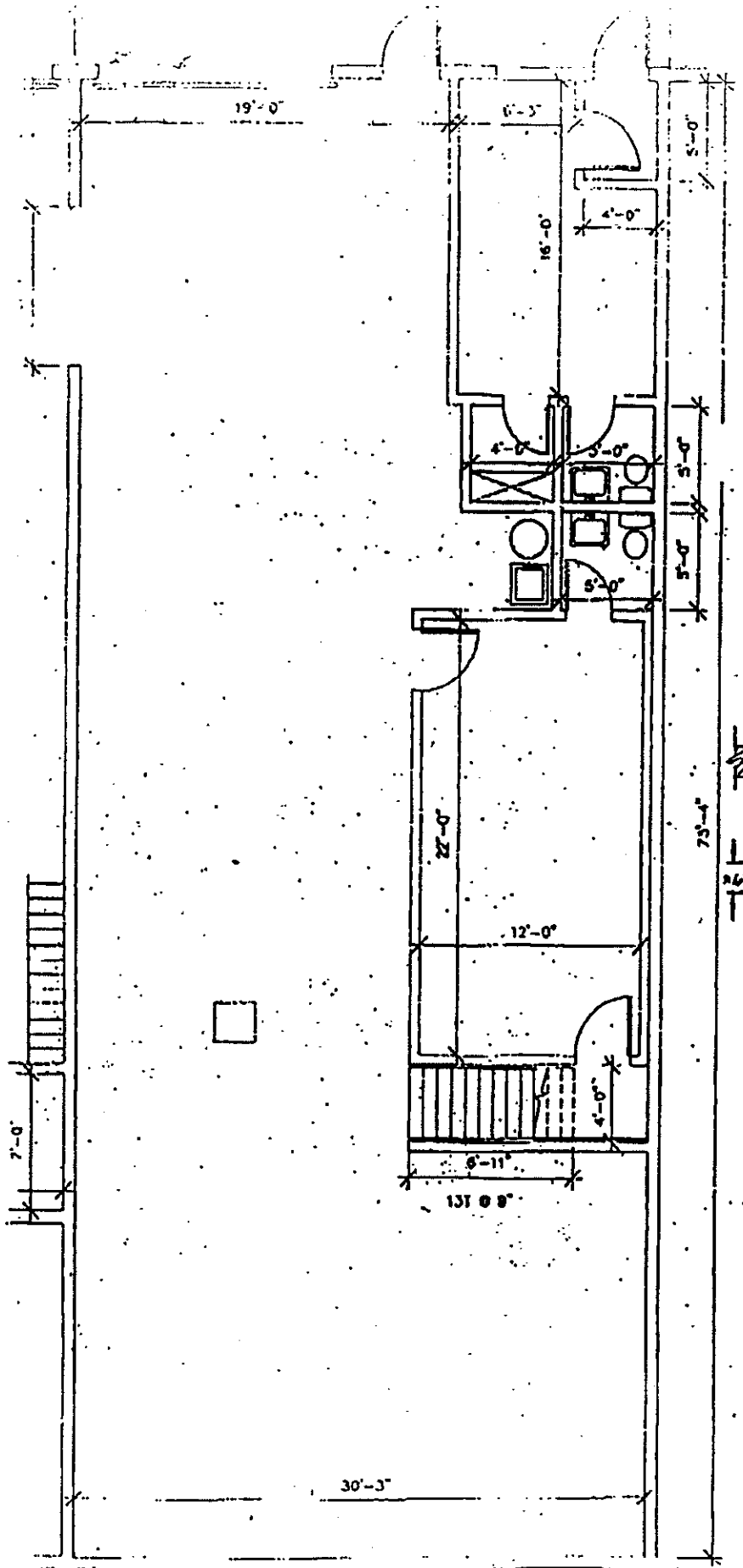
See attached photographs.

CONCLUSION

Based on the information gathered during the site inspections, it appears that the two trenches are free of cracks or gaps and are sufficiently impervious to contain leaks or spills until the collected material is detected and removed as required by 40 CFR 264.175(b)(1).

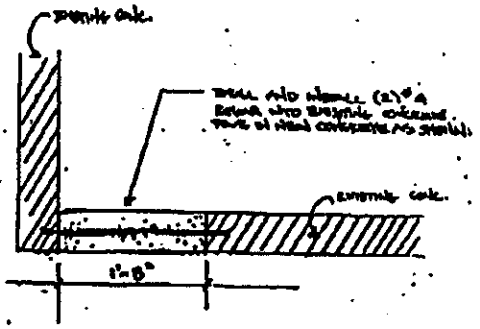

3
67'-0"
9'-0"
11'-0"
15'-0"
15'-5"
4'-0"
4'-0"
5'-0"
5'-0"
6'-0"
17'-0"
14'-0"
8'-8"
1'-0"
58'-13"
6"
12'-0"
6"
75'-8"
6"
7'-0"
19'-0"
DRUM
STORAGE
25'-0"
32'-0"
A
7000
26'-0"
13'-0"

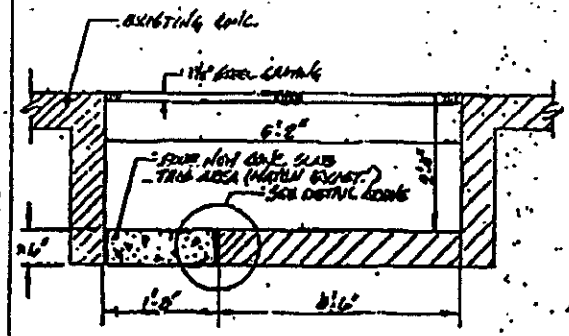
4



TYPICAL DETAIL (TYPICAL) AT MOKENA, IL

NOTE: EXPOSED CONCRETE TO BE TROWELLED AFTER FINAL CONCRETE HAS CURED.





SECTION A-A

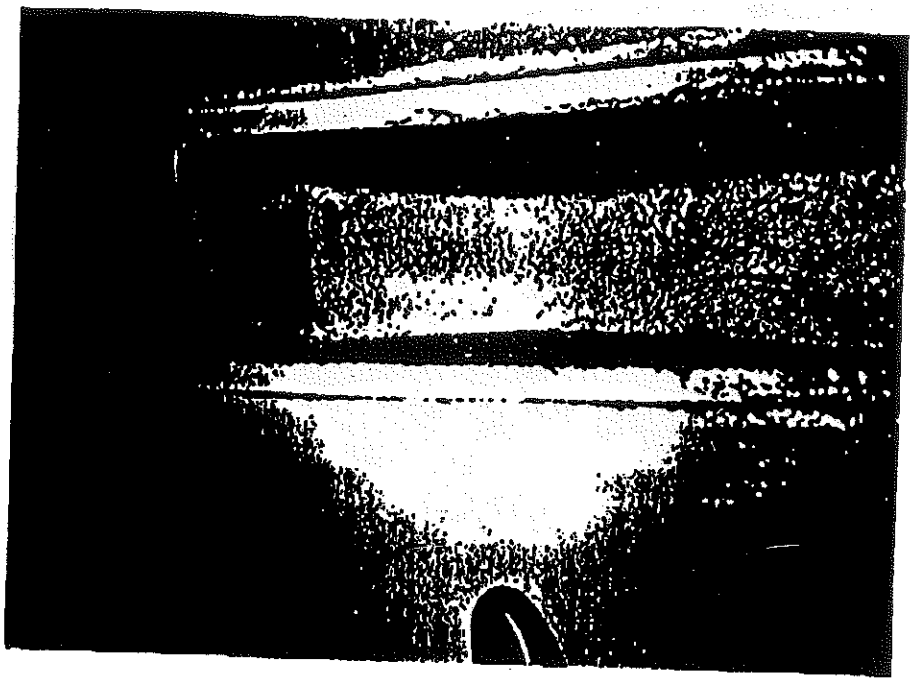
NO.	DESCRIPTION	BY	CHKD	APVD	DATE
5	ADDED CLEAN-OUT AT GRID 1	MRD			11-11-91
4	REVISED VESTIBULE DETAIL	MRD			11-11-91
3	ADDED CORNER GUARDS	MRD			10-23-91
2	ADDED DOOR / DETAILS	MRD			9/18/91
1	ADDED PLAN NOTES	MRD			9/9/91

REVISIONS

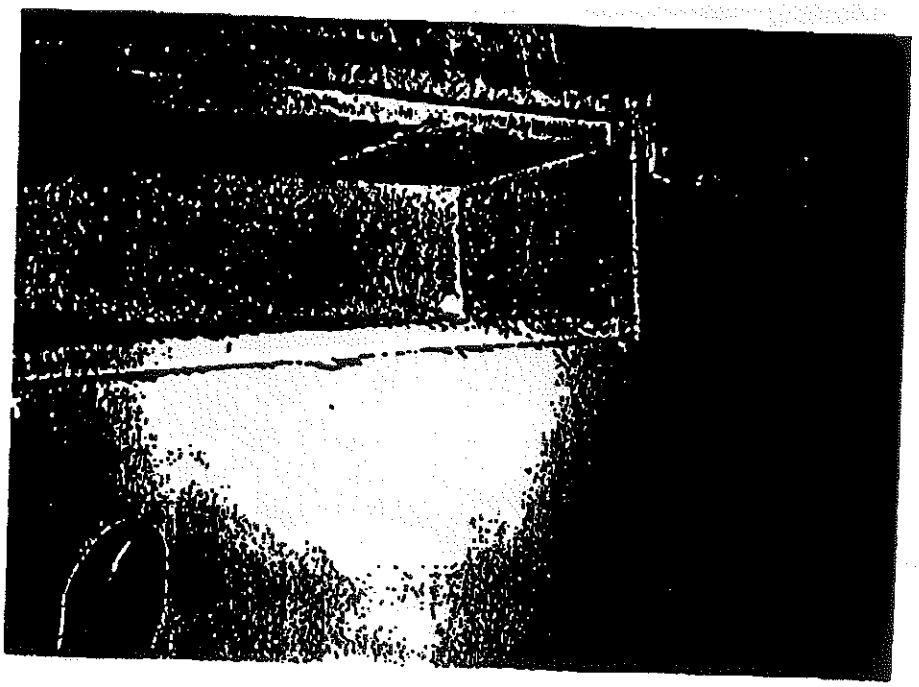
TITLE: FLOOR PLAN A

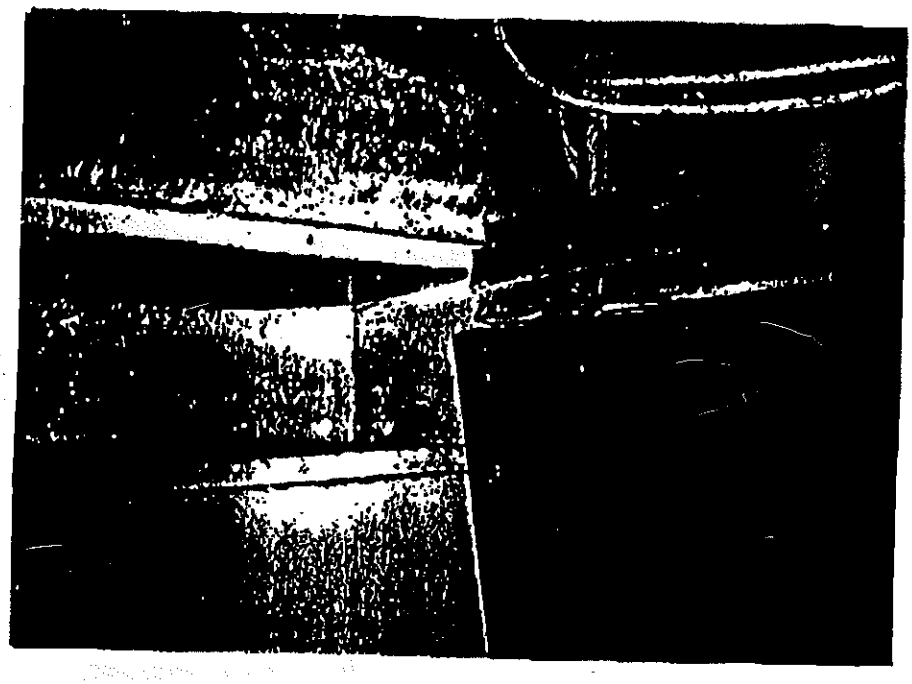
SAFETY-KLEEN CORP.

BRANCH: SERVICE CENTER MOKENA, IL	SCALE: 1/4"=1'-0"	DRAWING NO.: B-03405-7000-00	SHT. NO.: 2

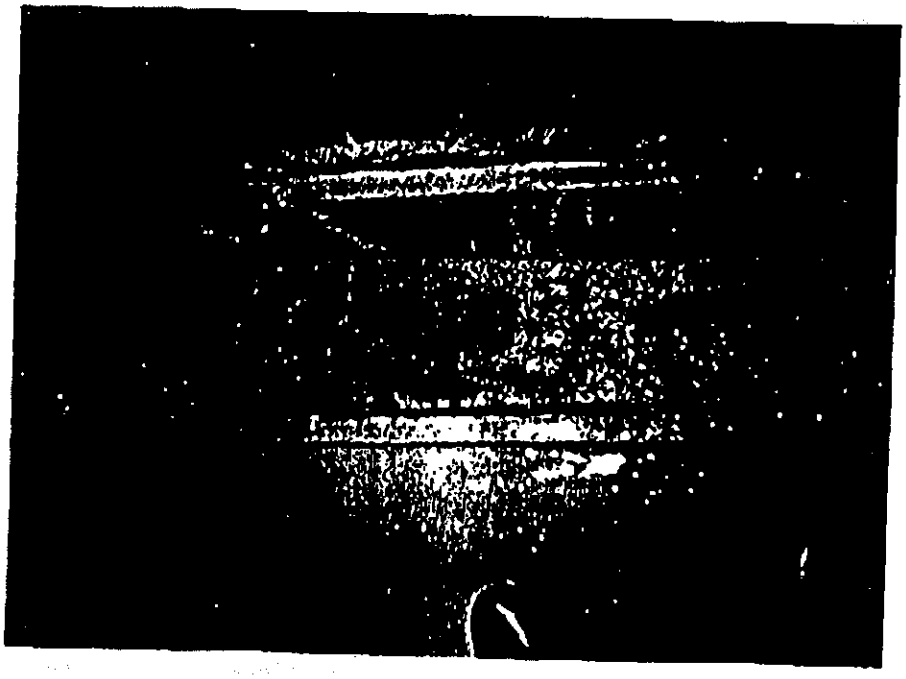


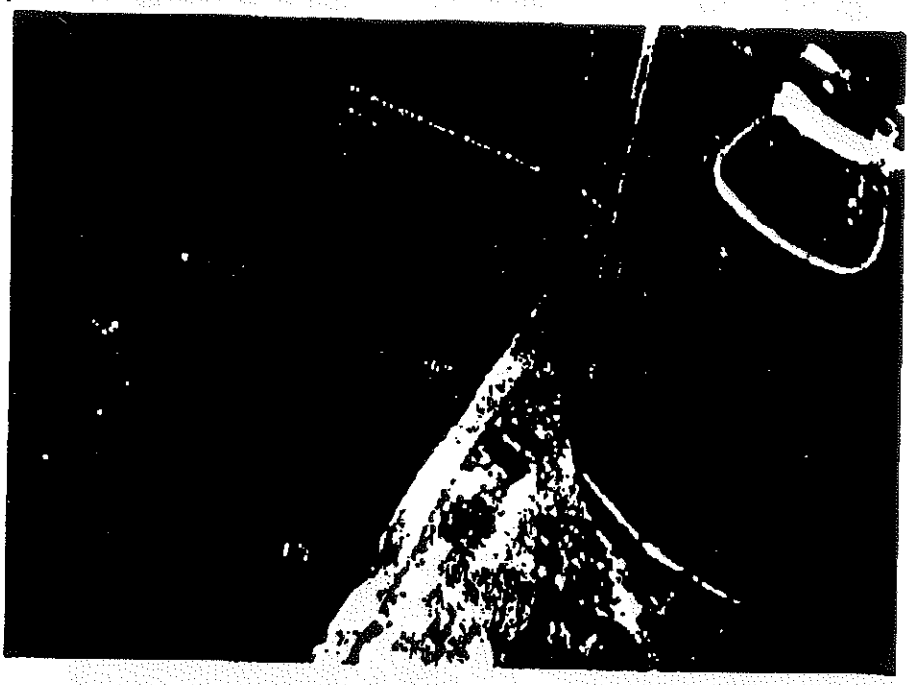
Trench without sewer pipe before water test. Photo taken November 25, 1991.



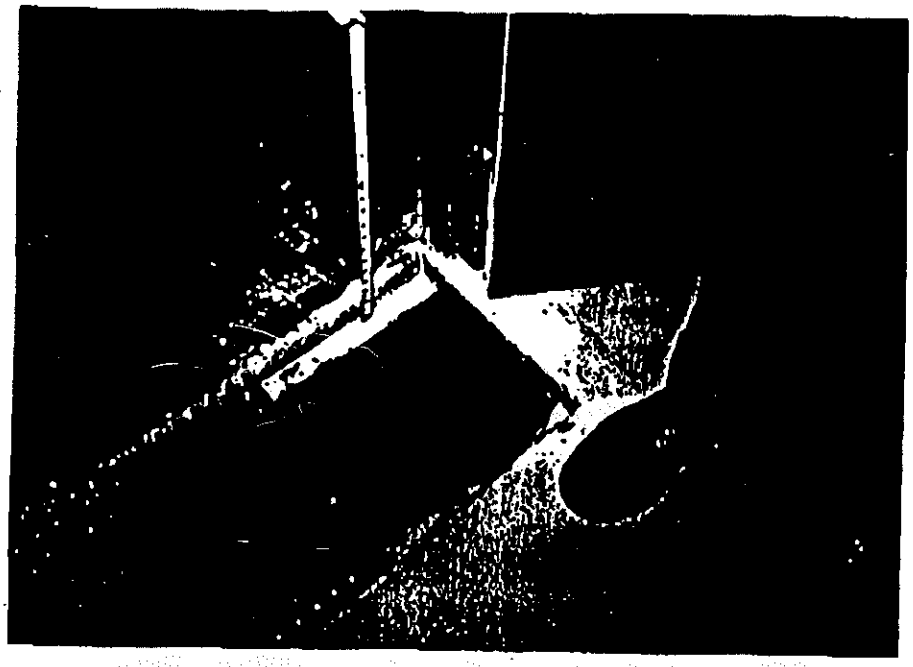


Trench with sewer pipe before water test.
Photo taken November 25, 1991.

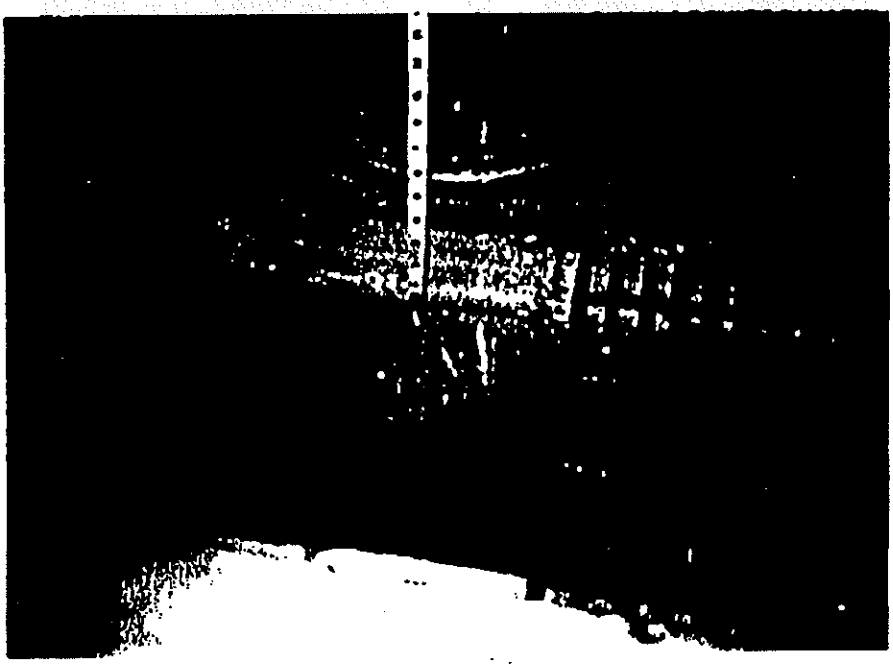




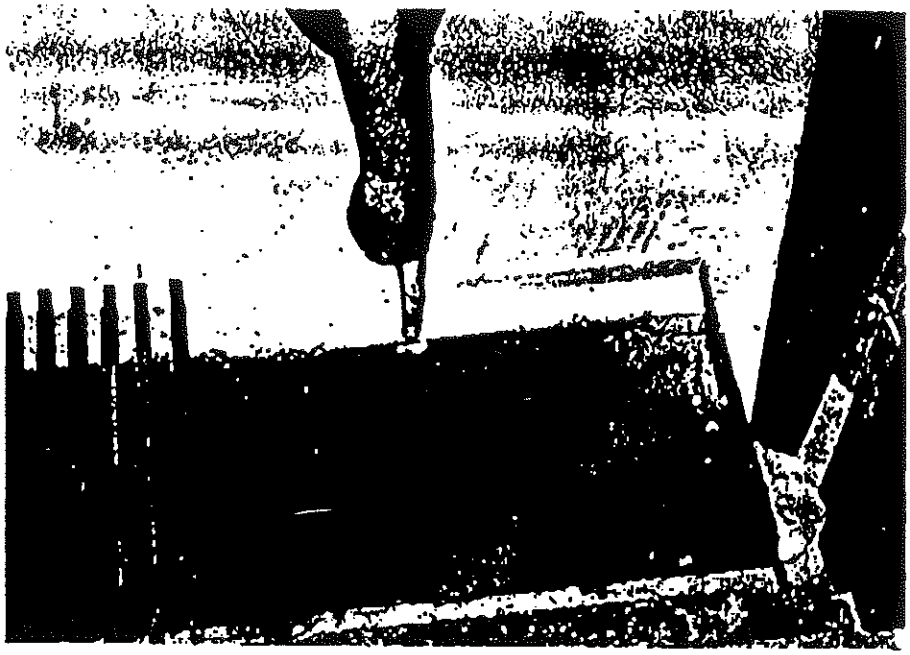
Trench with sewer pipe after being filled with water. Photo taken November 25, 1991.



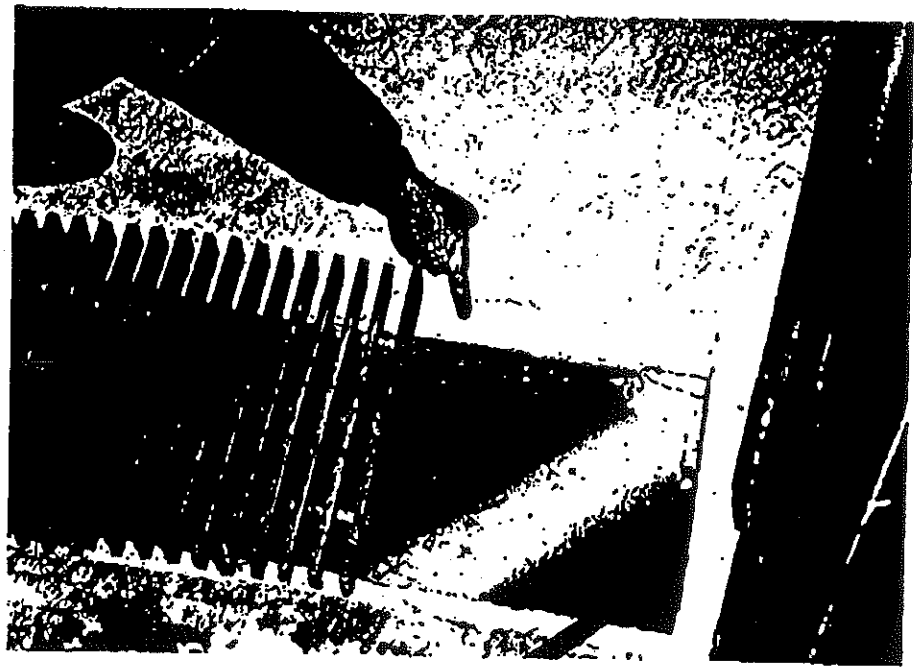
Trench without sewer pipe. The water had not dropped in 24 hours. Photo taken November 26, 1991.



Trench with sewer pipe. The water level dropped about 3/4" in 24 hours. Photo taken November 26, 1991.



Trench with sewer pipe at beginning of 24 hour water test. Photo taken December 6, 1991.



Trench with sewer pipe after 24 hour test. The water had not dropped. Photo taken December 7, 1991.

APPENDIX E

SOIL SAMPLING PROCEDURES

FIELD PROCEDURES FOR SOIL/SEDIMENT SAMPLING

Procedures for collection and handling of soil and sediment samples and related quality assurance samples are described in this section. The field procedures include:

- Pre-Field Coordination and Preparation
- Equipment Decontamination
- Field Documentation and Logging
- Sample Collection Techniques and Equipment
- Chain-of-Custody Control
- Post-Field Activities.

Pre-Field Coordination and Preparation

Several activities will be conducted prior to departure for the project site. A project team is assigned and the members will begin coordinating the sample collection event with designated project management staff, drilling or excavating subcontractors, the laboratory, and regulatory agencies. Field equipment will be checked and organized. Applicable project documents, workplans, and health and safety plans will be reviewed. Site access will be checked with management staff, and provisions will be made to mobilize the necessary equipment and staff to the project site.

Project Team

The sampling project team will consist of the project manager, the task leader, and field team (if necessary). The qualifications and responsibilities of individual project team personnel with respect to the field activities are:

1. Project Manager

   a. Schedule the sampling event;

   b. Assign qualified personnel to the field team;

c. Monitor sampling activities to ensure compliance with the Workplan (calls from field personnel, etc.); and

d. Review field data and chain-of-custody/sample-analysis-request records to ensure compliance with the Workplan.

2. Field Task Leader

a. Knowledgeable in sampling techniques;

b. Knowledgeable in operation and maintenance of instruments;

c. Knowledgeable about project health and safety plan and procedures; and

d. Responsible for:

i. Ensuring compliance with the Workplan;

ii. Preparations for sampling event;

iii. Ensuring the proper equipment is available and operating;

iv. Assigning field team members' responsibilities and overall supervision (if necessary);

v. Onsite client contacts;

vi. Logging field data;

vii. Shipping or transporting samples;

viii. Chain-of-custody/sample-analysis-request forms; and

ix. Subcontractor and laboratory contact.

3. Field Team Members

a. Knowledgeable in sampling techniques;

b. Knowledgeable about the project health and safety plan;

c. Able to calibrate and operate instruments properly;

d. Log data acquired during sampling; and

e. Assist the task leader as necessary.

Preparation

The project manager will review the Workplan and related correspondence to determine if any plans or reports need to be brought to the site during sampling activities, if any changes have been made to the sampling and analytical procedures, and if any groups need to be contacted about sampling observation or split sampling.

The project manager and any subcontractors working on the project will be contacted to confirm the expected arrival time at the site and expected departure time. The laboratory will be informed when sample containers are expected to arrive and the method and location of arrival.

All sampling and monitoring equipment will be inspected prior to departure to ensure that it is in proper working order. The necessary health and safety monitoring equipment (as described in detail in the Health and Safety Plan(s) will also be inspected and prepared for departure to the project site.

Equipment Inventory

The following equipment and supplies may be used for soil and sediment sampling:

- Sampling Equipment
  - Heavy drilling and or excavating equipment
  - Concrete cutter and/or electric rotary hammer drill and bits
  - Stainless steel or aluminum shovel and trowel
  - Manual soil auger or drive sampler suitable for use with brass or stainless steel soil sampling rings or thin-walled (Shelby) tubes
  - Shoring box (if test pits or excavations greater than four (4) feet in depth are to be entered by field staff)
  - Sampling rings and/or thin-walled tubes, teflon liners, and plastic caps
  - Glass jars (1-liter) with teflon-lined lids

- Mallet
- Marking pen and labels
- Decontamination equipment and containers (steam-cleaner, detergents, wash and rinse vessels, scrub brushes, etc.)
- Distilled or deionized water
- Plastic sheeting
- Coolers with blue ice or equivalent
- Field log book and appropriate log/record forms and custody forms

o Health and Safety

- Photoionization detector
- Combustible gas detector
- Gas detector tubes (if appropriate)
- Personal protective equipment (respiratory, protection, protective clothing, gloves, boots, eye protection, hard hats, ear protection, etc.)

Safety Procedures

The field task leader will review the Health and Safety Plan(s) and make copies of the Plan(s) available to all field team members. The field task leader will inform all field team members immediately before work commences of the kinds of contaminants found or expected to be found at the site, and the possible hazards.

The field task leader will be responsible for bringing the appropriate environmental surveillance and safety equipment to the sampling site. All field team members will be knowledgeable in the operation of necessary surveillance equipment. Each field team member is responsible for 1) bringing appropriate personal safety equipment to each sampling site during monitoring, 2) making sure the equipment is functioning properly and is immediately available for use, 3) recognizing safety or health hazards, and 4) undertaking the appropriate safety precautions.

The field team will consist of a minimum of two people at or in the general vicinity of the sampling site. If a field team member will be out of visual contact with the other member(s) of the sampling party, he or she will inform the field task leader of his/her location and activity.

Access Control

Protective measures will be employed for limiting access to the sampling sites during sampling, particularly where the use of excavations and/or heavy equipment is required. The field task leader (or designate) will be present at each sampling site during the entire sampling period. The field task leader will be responsible for controlling any activities that might influence the integrity of the sample collection procedures or the health and safety of the field team or general public.

Equipment Decontamination

Sampling equipment and containers will be decontaminated prior to sampling, either in the laboratory or in the field. The sampling devices will be decontaminated in the field immediately prior to and after sampling each site. All sampling equipment will be disassembled into component parts prior to washing.

Field decontamination of heavy equipment will be accomplished using high-pressure steam followed by a tap-water rinse. Decontamination of sampling devices and containers will include washing in a warm non-phosphate detergent solution, rinsing the devices and containers with tap water, and then rinsing the devices with distilled or deionized water. Sampling devices and containers will be dried before use by air drying or with clean paper towels. Wash and rinse water will be replaced at a frequency sufficient to prevent carry-over of contaminants or target analytes through the decontamination process.

Decontaminated sampling devices and containers will be stored in contaminant-free locations or containers until use. Thin-walled tubes, sampling rings, and glass jars may be stored until use in clean sample coolers.

Field Documentation and Logging

Field observations are critical to the verification and interpretation of the laboratory data. Field observations during soil sampling will be recorded in a field log book or on appropriate forms. The following information will be recorded as appropriate:

- Date and name of observer
- Names and affiliations of sampling team members
- Names and affiliations of others present at the sampling sites
- Weather conditions
- Sampling location and time of sampling
- Surveyed coordinates of sampling location (if required)
- Health and safety data on total organic vapors, etc.
- Health and safety measures implemented
- Sampling site condition upon arrival (concrete cover, standing water, erosion, etc.)
- Soil characteristics and texture
- Soil observations, including discoloration, hydrocarbon sheens, moisture content, etc.
- Deviations from or clarifications of sampling procedures in the Workplan.
- Miscellaneous conditions which the sampling team finds noteworthy.

The field task leader will review and initial the field records and logs after each day of sampling.

Sample Collection Techniques and Equipment

A critical aspect of any soil or sediment sampling program is selection and implementation of an appropriate sampling technique. Access to the soils or sediments

to be sampled may be gained using a variety of equipment. Selection of equipment and technique should be appropriate for the volume of material required and the type of analysis to be performed. In general, the sampling equipment and technique should minimize, to the extent possible, the amount of handling a sample will undergo prior to analysis. In many cases, the material to be sampled will be easy to access and simple "grab" samples collected using a shovel, trowel, or drive sampler are appropriate. In other cases, the soils or sediments may be difficult to access and sampling will involve the use specialized equipment. Procedures and equipment associated with the various soil and sediment sampling sites specified in the Workplan are discussed below.

Surficial Grab Samples

Surficial grab samples will be collected from the upper 12 inches of material to be sampled using a decontaminated drive sampler equipped with brass or stainless steel sampling rings, or a thin-walled tube sampler. The sampling device will be driven completely into the material using a manually operated auger, drive hammer or mallet. The sampling device will then be extracted from the material using a shovel or trowel. Filled sampling rings or the thin-walled tube will then be removed from the sampling device and immediately sealed on both ends with teflon sheeting and plastic caps.

If the material contains large cobbles or stones, or lacks sufficient cohesion to remain in the sampling rings or thin-walled tube, the material will be scooped with a clean trowel into clean glass jars. The jars will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with teflon-lined lids.

Sample containers will be immediately labeled, recorded in the field log book or record forms, and stored on blue ice (or equivalent) for transport to the laboratory. No preservatives will be added to the soil sample containers. The Packaged samples will be accompanied by appropriate custody and analytical request documents and will be delivered or shipped to the laboratory within 24 hours of sample collection.

Test Pits and Excavations

A number of soil/sediment samples will be collected from the subsurface. In cases where the sampling depths are relatively shallow (typically less than 10 feet), the use

of test pits or an excavation will provide an economic and effective alternative to the use of test borings. Test pits or excavations also provide the opportunity for direct examination of subsurface materials to be sampled. Procedures for excavating, logging and sampling of test pits and excavations are discussed below.

Excavation

Once a test site has been selected, the field task leader will be responsible for ensuring that adequate access controls and health and safety precautions have been implemented. In general, test pits or excavations in which soil/sediment sampling purposes will not be greater than 10 feet in depth. The test pits will typically be excavated using heavy equipment such as a back-hoe. All excavating equipment that comes into contact with the material to be sampled will be thoroughly decontaminated prior to use.

In most cases, excavation and sampling activities will not require that field personnel enter the test pit or excavation. However, if it is necessary for a field team member to enter a test pit or excavation that is greater than four (4) feet in depth, the excavation will be constructed in a manner that is suitable for entry in accordance with OSHA regulations listed in 29 CFR Part 1926 (Occupational Safety and Health Standards Excavations; Final Rule). Only one field team member at a time will be allowed to enter the excavation and at least one observer will be available during the entry. Excavations will not be entered under any circumstances if oxygen-defficient or hazardous atmospheres are known or suspected.

Logging and Sampling

As excavation proceeds, the field task leader (or designate) will be responsible for documenting or recording all pertinent information in the field log book or on appropriate forms. In addition to the information specified in the Field Documentation Section above, the designated observer(s) will document the following:

- Dimensions and orientation of the finished excavation;
- Number, location and depth of samples collected;
- Soil/sediment profile of the excavation;
- Depth and character of fluids entering the excavation (if any);

- o Stability characteristics of excavation walls; and
- o Whether field personnel entered the excavation and, if so, why and what safety precautions were implemented

Sampling of excavations will generally be conducted by instructing the equipment operator to collect a volume of soil or sediment from a specified location using the excavating equipment. The sample will then be brought to the surface and transferred directly to sampling rings or appropriate glass containers. Sampling rings will be filled by pressing the rings into the material in a manner that minimizes head space. If glass containers are used, the material will be scooped into the container using a clean trowel and the container will be tamped to minimize head space. Filled containers will then be labeled and handled in the same manner specified above for grab-sample containers.

Abandonment

Upon completion of excavation, logging and sampling, the equipment operator will be instructed to back fill the test pit with the excavated material or approved backfill material as specified in the Workplan. Filled pits will be compacted and returned to original grade. Any surficial concrete or pavement that was removed will be replaced to match previous conditions or meet specifications in the Workplan.

Test Borings

Test borings will be used to collect subsurface soil or sediment samples in cases where access conditions, the depth or character of material to be sampled, or other circumstances precludes the use of excavations. Procedures for drilling, logging, sampling, and abandonment of test borings are discussed below.

Drilling

Test borings will be drilled to an appropriate diameter and depth using solid or hollow-stem augers, hand augering or truck-mounted drilling equipment, or small-diameter hand-held drilling equipment. These drilling techniques are preferable for several reasons:

1. No contamination will be introduced into the boring during drilling;

2. The character of soils or sediments will not be impacted with drilling fluids; and

3. The drilling methods are appropriate for the depths, types and locations of sampling to be conducted.

Selection of the appropriate drilling and sampling technique will be based on the type of information desired, the type of analysis specified, and on the anticipated depth, character, and hardness of material to be sampled. In general, brass sampling tubes or thin-walled tube samplers driven into place and then sealed with teflon-lined caps are preferred for collection of samples that will undergo chemical analysis. This is because undisturbed samples of soils and unconsolidated sediments can be collected rapidly with good integrity and minimal disturbance. This technique also allows overlying material to be isolated from the sampling interval as drilling advances.

In cases where lithified sediments or rock must be penetrated or sampled in order to obtain the desired information, an alternate technique (likely air- or foam-rotary) will be used. If relatively undisturbed samples of lithified sediments or rock are to be collected, it will be necessary to use a core barrel or similar device. Because collection of core samples requires the use of down-hole lubricating fluids, such samples are typically undesirable for analysis of chemical analytes. In cases where chemical analysis of lithified sediments or rock is desired, cuttings samples collected from the drilling procedure will suffice. Such cuttings samples will be scooped from the cuttings discharge area with a clean trowel into clean glass jars. The jars will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with teflon-lined lids.

If the material contains large cobbles or stones, or lacks sufficient cohesion to remain in the sampling rings or thin-walled tube, an iterative drilling and sampling procedure will be used in order to collect cuttings samples from specified depth intervals. The auger will be advanced with rotation through the specified sampling interval to load the auger flight with material to be collected. The auger will then be retrieved without rotation to bring the material to the surface. The material will then be scooped from the auger flights with a clean trowel into clean glass jars. The jars will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with teflon-lined lids.

Logging and Sampling

The character of materials penetrated will be documented on appropriate log forms. Specific characteristics to be documented include:

- Material Type(s)
- Color
- Hardness
- Grain Size
- Grain Shape
- Odor
- Sorting
- Cementation
- Structure
- Composition
- Texture
- Staining

Test boring logs will also reflect the depth and type of samples collected, occurrence and depth of any water-bearing zones, and any evidence of visual contamination or organic contamination based on field screening using a photoionization detector (PID) and/or combustible gas detector as specified in the Workplan. A qualified geologist, engineer, or environmental scientist will be onsite for the drilling, logging, and completion of each test boring.

Abandonment

Test boring abandonment will be conducted in accordance with procedures specified in the Workplan and any applicable regulations. In general, test borings will be sealed from the bottom up using a sealing material with a saturated hydraulic conductivity of 10^{-7} cm/sec or less. Materials that are suitable for plugging and abandonment include neat cement, sand-cement grout, concrete, and bentonite clay. Cuttings remaining after the abandonment procedure will be collected and disposed of in accordance with procedures in the Workplan.

Chain-of Custody Control

"Cradle-to-Grave" custody control will be implemented during handling of all soil/sediment samples. The information provided on the sample label will be complete and accurate. A completed custody record and analytical request form will accompany each shipment of sample containers from project site to the laboratory. Finally, a

custody seal will be placed on the shipping container to minimize the possibility of sample tampering.

Sample Label

Each sample container will be identified with a label. The information which will appear on the sample container label includes:

1. Sample identification number
2. Place of collection and project number
3. Date and time of collection
4. Personnel collecting the sample
5. Preservative (none in the case of soil or sediment samples)
6. Analyses requested
7. Any special information that may be appropriate

Chain-of-Custody Forms

All samples will be accompanied by completed custody/ analytical-request forms. The field task leader will retain a copy of this completed form for the project file, the original will accompany the samples from the point of origin to final destination. The completed form will provide an accurate account of parties who handled the samples. Custody/request records will be supplied by the laboratory.

Custody Seal

When the samples leave custody of the sampling team, the shipping container will be sealed with a custody seal to ensure that the samples have not been disturbed during transportation to the laboratory. The laboratory personnel receiving the coolers will note the condition of the seal and the sample containers on the custody record.

Post-Field Activities

The field task leader and field team members are responsible for several activities after the samples have been shipped to the laboratory and all field activities have been completed. The post-field responsibilities include laboratory contact, record filing, and equipment checks.

Continued Supervision

The field task leader or project manager will call the laboratory on the day the samples are due to arrive at the laboratory to ensure that they have arrived. The project manager or field task leader will call the laboratory periodically to make sure that samples are being analyzed within the holding times specified for the analytical methods requested.

Records

The project manager or field task leader will collect all pertinent field data (i.e., chain-of-custody, copies of field log-book, field record forms, etc.) and file them in the project file immediately after returning from the field. Proper and efficient management of the sampling records will aid in reviewing and evaluating the laboratory analytical data. The field task leader or project manager will also ensure laboratory data are placed in the project file and entered into the computer data base, if appropriate.

Equipment

Any equipment problems noted during sampling and not corrected in the field will be corrected upon return to the office. Broken or contaminated equipment will not be returned to storage for future use.

APPENDIX F

GROUND-WATER MONITORING PROCEDURES

PROJECT: 010

GROUND-WATER MONITORING PROCEDURES MANUAL

July 1991

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Introduction

Success in compliance with the regulatory ground-water monitoring programs will depend in part on the ability to provide reliable water level and water quality data. Many of the routine sampling procedures have been monitored by the EPA and various state environmental regulatory agencies.

All employees involved in ground-water sampling projects are required to review this procedures manual before sampling to ensure the continued generation of reliable data. These procedures are based on experience gained from collecting thousands of ground-water samples and the latest information available in guidance manuals. This manual may be updated as additional experience and information are acquired.

Pre-Field Activities

Several activities are conducted prior to departure for the project site. A project team is assigned and the members begin coordinating the sample collection event with the client(s) and laboratory. Field equipment is checked and organized. Pertinent Health and Safety criteria are reviewed, and a Health and Safety Plan may be developed. Monitoring well access is checked, and provisions are made to pack the necessary equipment and well keys for delivery to the project site.

Project Team

Water quality project teams will consist of the project director, the sampling supervisor, and field team members. The qualifications and responsibilities of individual project team personnel are:

1. Project Director

    a. Schedule sampling events;

    b. Assign qualified personnel to the field team;

    c. Monitor sampling activities (calls from field personnel, etc.); and

    d. Management of report preparation.

2. Sampling Supervisor

a. Qualified chemist;

b. Knowledgeable in sampling techniques;

c. Knowledgeable in operation and maintenance of instruments;

d. Knowledgeable about site safety plan and procedures; and

e. Responsible for:

i. Logging data;

ii. Shipping samples;

iii. Chain-of-custody/sample-analysis-request forms;

iv. Laboratory contact;

v. On-site client contacts;

vi. Assigning field team members' responsibilities and overall supervision;

vii. Preparations for sampling event; and

viii. Ensuring the proper equipment is available and operating.

3. Field team members

a. Knowledgeable in sampling techniques;

b. Able to calibrate and operate instruments properly;

c. Log data acquired during sampling; and

d. Assist the sampling supervisor as necessary.

Preparation

The sampling supervisor will review the current sampling and analysis plans and assessment reports to determine if any plans or reports need to be brought to the site during monitoring. The sampling supervisor will also

evaluate whether any changes have been made in the sampling and analytical procedures, and if any groups need to be contacted about split sampling.

The sampling supervisor will review available water quality and water level data before leaving for the sampling site. This preparation ensures that the proper equipment and personnel are available at the site.

All monitoring equipment will be inspected prior to departure, ensuring that it is in proper working order. The specific conductance and pH meters should be operated and standardized before going to the field.

Equipment Inventory

The following equipment and supplies are available for ground-water monitoring:

1. Water Level Measurements

   - Well and gate keys
   - Actat M-scope (if hydrocarbon contamination is not expected)
   - Oil/Water Interface Probe (if hydrocarbon contamination is expected)
   - Steel Tape and Hydrocarbon Paste
   - Gloves

2. Hydrocarbon Thickness Measurements

   - Well and gate keys
   - Oil/Water Interface Probe
   - Steel Tape and Hydrocarbon Paste
   - Gloves

3. Water Quality Monitoring

   - Well and gate keys
   - Bailers - PVC, teflon, and/or stainless steel (select proper type, diameter, and length)

- Bladder pump, logic unit, sample line, airline, regulator, and pressure source (pump or nitrogen tank)
- Rope and cable for sampling devices
- Detergent or solvent for cleaning bailers
- Bailer winch and pipe vice
- Tarps
- Separatory funnel
- Blank PVC casing with bottom cap for discrete fluid sample collection
- Gloves
- Buckets for water disposal
- pH meter, probe, and two buffer solutions
- Conductance meter and probe
- Thermometer or temperature probe
- Glass or plastic beaker for field analyses
- Filtration unit, appropriate filters, regulator, and pressure source (pump or nitrogen tank)
- Sample bottles and preservatives
- Coolers and bagged ice or Blue-ice
- Distilled water and squirt bottles
- Brushes dedicated for decontamination
- Decontamination containers dedicated for wash, rinse 1 and rinse 2
- Bailer storage bags
- Chain-of-custody/sample-analysis-request forms

4. Safety Equipment

- Health and Safety Plan
- Hard hats
- Goggles or safety glasses
- Gloves
- Tyvec suits and booties
- Appropriate shoes or boots
- Respirators with appropriate cartridges
- Explosimeter and/or organic vapor meter
- First-aid kit

Selection of Sampling Equipment

Various sample collection equipment will be used, dependent on the constituents monitored. The following sampling devices are available:

1. Gas-operated teflon bladder pump with adjustable flow
2. Double and single check valve teflon bailers
3. Single check valve stainless steel bailers
4. Submersible pumps with teflon impellers and dedicated discharge tubing

The selection of teflon or stainless steel depends on the constituents of principal interest: teflon is the preferred choice when inorganic constituents (including metals) are of principal interest, and stainless steel is the preferred choice when organic constituents are of principal interest. PVC bailers will be used for evacuating wells prior to sampling, but does not use equipment of PVC construction for the actual sampling.

Safety Procedures

The sampling supervisor will review all available data and determine the possible health and safety hazards at the site. He or she will prepare a Health and Safety Plan (if determined by the sampling supervisor to be necessary), and

make copies of the Plan available to all field team members. He or she will inform all field team members immediately before monitoring of the kinds of contaminants found or expected to be found at the site, and the possible hazards.

The sampling supervisor will be responsible for bringing the appropriate safety equipment to the monitoring site. All field team members will be knowledgeable in the operation of safety equipment he or she will be using. Each field team member is responsible for (1) bringing appropriate safety equipment to each well during monitoring, (2) making it immediately available for use, (3) recognizing safety or health hazards, and (4) undertaking the appropriate safety precautions.

The field team will consist of a minimum of two people at or in the general vicinity of the sampling site. If a field team member will be out of visual contact with the other member(s) of the sampling party, he or she will inform the sampling supervisor of his/her location before heading to the monitoring site.

Access Control

Various protective measures for limiting access to ground-water monitoring wells are employed. Access to individual monitoring wells is controlled by one or more of the following methods:

1. Oversize above-ground protective steel casing with locking lid;

2. Flush mounted well boxes with locking lids and seated box covers; or

3. Wells installed in a controlled access area (i.e., inside the perimeter of a fenced area with locking gates).

The measures listed above ensure only authorized personnel will have access to the monitoring well network. Well keys are retained by the client (e.g., property owner and/or lease holder), project director, and other authorized personnel.

Sample Collection

Activities conducted during a sample collection event include monitoring of fluid levels, well preparation, and sample collection. If immiscible fluids are present and discrete fluid samples are required, the non-aqueous samples are collected prior to well preparation. The procedures for sample collection, listed in order of implementation, are:

1. Fluid level measurements;
2. Collection of immiscible fluids;
3. Well preparation;
4. Sample withdrawal;
5. Field analysis; and
6. Filtration.

Water Level and Hydrocarbon Thickness Measurements

Fluid level data are collected every time that a water quality monitoring event takes place, to determine the horizontal and vertical ground-water flow gradients. Water level and hydrocarbon thickness measurements are collected prior to preparing the well for sample collection. The total depth of the well is periodically measured to determine if the well is silting in and needs to be rehabilitated or replaced. The total depth of the well is needed as well as the water level in order to calculate the volume of standing water in the casing. This ensures that the proper volume of water will be evacuated to provide a sample representative of formation fluids.

In wells with no light immiscible phase (i.e., hydrocarbon floating on the water), an electronic measuring device, such as Actat M-scope, is used to measure the depth to the surface of the ground water. When the signal has tripped, the probe is slowly lowered and raised to accurately identify the water surface. These measurements are recorded to the nearest 0.01 foot. The point of reference is marked on the north side of the well casing, unless otherwise specified.

In wells with light and/or dense phase immiscible layers, an electronic oil/water interface probe is used to determine the interfaces of the immiscible layers (ie., air to light immiscible, light immiscible to water, and water

to heavy immiscible). As the interfaces are detected, the probe is slowly lowered and raised to ensure accurate measurement of the interface. These measurements are recorded to the nearest 0.01 foot. The point of reference is marked on the north side of the casing, unless otherwise specified.

All measurements during a particular monitoring event are made to the designated reference points with the same instrument, to ensure internal consistency. The vertical reference points (i.e. north side top of casing) are established by a licensed surveyor or under supervision of a professional engineer in relation to the nearest permanent benchmark (i.e., USC and GS, USGS, or NGVD). The horizontal well coordinates are established by marking distances in reference to the project site plan in triangulation or by surveying in reference to the nearest permanent benchmark.

Collection of Immiscible Fluids

If separate phase sampling is required, immiscible fluids (either "floaters or sinkers") are collected prior to well preparation. The presence of an immiscible fluid layer is detected as outlined in the previous section "Water Level and Hydrocarbon Thickness Measurements." The type and measured thickness of an immiscible fluid layer determines which procedures to follow for collection of discrete fluid samples.

The bailer and rope lengths are measured prior to the sample collection. In wells with light phase immiscible fluids, a top-loading or bottom flow control bailer may be used for sample collection. A separatory funnel or control-flow bottom emptying device can be utilized to separate the immiscible fluid from ground water collected when a thin immiscible fluid layer is present.

Dense phase immiscible fluids are collected by lowering a bottom-loading bailer below the depth the dense phase immiscible layer is detected. A separatory funnel or control-flow bottom emptying device can be utilized to separate the immiscible fluid and ground water collected when a thin immiscible fluid layer is present.

Well Preparation

The column of standing fluid, calculated based on the fluid level and total casing depth, is used to determine the volume of water to be removed from the well for development. A minimum of three times the calculated well

casing volume is evacuated from a well, except when slow recovery is encountered due to low formation permeability. Contaminated ground water produced during well development should be discharged to the nearest waste disposal, recycling, or treatment facility, or stored in drums until it can be transported to an approved disposal, recycling, or treatment facility.

If the well is incapable of yielding three times the casing volume, it will be evacuated to dryness. When the well recovers sufficiently, a sample is checked for pH, conductivity, and temperature, and the samples are then collected. After sample collection, a final check of pH, conductivity, and temperature is made to verify water quality stability.

During at least one sampling event per site, changes in pH, temperature, and specific conductance versus volume of water evacuated are measured in several wells. A minimum of five casing volumes of water are evacuated during this testing. The purpose of this test is to verify that evacuation of three volumes results in stability of the field parameters, which implies that representative formation water is being sampled.

All well development data are recorded in the supervising sampler's field log book. In the event more than one sampling team is onsite, data logged in the technician's log book will be transferred to the supervisor's notebook.

Sample Withdrawal

To ensure the ground-water sample from a well is representative of the formation, physical and chemical alteration must be minimized during sampling. The following measures are taken to accomplish this:

1. Appropriate construction materials for sampling devices (see "Selection of Sampling Equipment"); and

2. Equipment blanks and thorough decontamination of field equipment between wells to ensure no cross contamination occurs (see "Decontamination Procedures Between Wells") if non-dedicated sampling equipment is used.

Ground-water samples are collected in order of decreasing volatility of the constituents being analyzed. A collection order for some common constituents follows:

1. Volatile organics (VOA)
2. Purgeable organic carbon (POC)
3. Purgeable organic halogens (POX)
4. Total organic halogens (TOX)
5. Total organic carbon (TOC)
6. Extractable organics
7. Total metals
8. Dissolved metals
9. Phenols
10. Cyanide
11. Major ions
12. Turbidity
13. Nitrate and ammonia
14. Radionuclides

The exception to this collection order occurs if the well produces lots of sediment. The samples for total and dissolved metals analyses can be moved up in the collection order so that the sediment does not make field filtration impossible or cause false conclusions about metals content in ground water.

Sample agitation is minimized by slowly lowering the sampling device into the well and transferring slowly from the sampling device to the sample container. The sample bottles should be filled to minimize headspace and all air bubbles must be eliminated from the final VOA sample.

With the exception of discrete-phase sampling when multiple phases are present, no intermediate containers will be used to handle ground-water samples, and samples will be transferred directly from the sampling device to sample containers. In the case where discrete sampling is required in a multiple-phase situation, one of the three following mechanisms will be selected to collect the aqueous phase:

1. Bottom-loading bailer equipped with a control-flow device.

2. Secondary sampling casing installed in the well such that light immiscible phases are isolated from the water column.

3. Separatory funnel used to decant the ground-water sample from the immiscible phase.

Selection of one of the above methods depends on field conditions and will be made appropriately such that consistency is maintained.

Samplers will wear clean gloves at each well, in order to prevent contamination of equipment and samples with the hands. Two field personnel are recommended for filling sample containers. One person handles the rope and bailer, and the other person handles the container.

Field Analyses

Specific conductance, pH, and temperature are measured at the time the well is sampled. The measurement procedures are:

1. The pH meter should be calibrated using National Bureau of Standards (NBS) approved buffers. Unless acidic conditions are anticipated, pH 7 and pH 10 buffers are used to calibrate the meter. Check the meter for specific calibration instructions.

2. After well preparation, collect some of the water being sampled in a beaker. Place the clean conductivity and temperature probes (or thermometer if the temperature probe is not available) in the beaker and gently swirl. Select the range on the conductivity meter that is approximately twice your reading (i.e., the reading is 980 μmhos, so the range selected would be 0-2,000 μmhos). Allow 30 seconds for equilibration, swirl the probes, and record the temperature and conductivity in the field log book.

3. Place the clean pH probe in the beaker used for conductivity and temperature, and gently swirl. Allow 30 seconds for equilibration, read the pH, and record in the field log book.

At each site, a temperature coefficient is determined so that all specific conductance measurements can be corrected to 25°C. At least one water sample is collected from a background well and another from a down-gradient well. The sample is refrigerated, and then allowed to warm

slowly. Temperatures and specific conductance measurements are taken during the warming process. A temperature coefficient is calculated from these measurements (as outlined in "Standard Methods for the Examination of Water and Wastewater" prepared and published by APHA, AWWA, and WPCF in 1980). Temperature-compensated field conductivities should agree closely with the laboratory conductivities.

Additional unstable water quality constituents measured in the field at the time of collection may include redox potential, dissolved oxygen, chlorine, and turbidity. If required, these parameters will be measured in the field with appropriate equipment (specific ion electrodes, for example).

Filtration

To minimize chemical changes of ground-water samples, filtration should be done within 10 minutes of sampling. Samples are transferred directly from the sampling device to the filtration device. Filtration will only be performed on samples collected for dissolved constituent analysis.

All ground-water samples are filtered with nitrogen or argon. Pore size of the filters is 0.45 micron. Samples which are filtered must be marked as such on the labels on the sample bottles.

The filter chamber should be thoroughly rinsed out with distilled water and decontaminated according to "Decontamination Procedures Between Wells" of this manual. The chamber needs to be rinsed with a small amount of sample, and approximately 50 ml of sample needs to be pushed through the filter before the filtrate is allowed to run into the sample bottle. The filter should be handled with tweezers to prevent contamination.

Observation should be made during filtration, including rate of filtration, color changes in the sample or filtrate, degassing, etc. Observations should be recorded in the field log book.

Sample Preservation and Handling

Laboratories are required to add the preservative to the sample bottles before they are shipped to the field, because the preservatives are more easily contaminated in the field. All samples are collected and preserved, and holding times followed in accordance with protocol as

listed in Table 2-16 of the 3rd Ed. of "Test Methods for Evaluating Solid Waste" EPA SW-846 (SW-846). Samples are not transferred from one container to another. The sample container type is noted in reference to the recommendations for sample container type by analysis listed in SW-846.

The sample containers are stored on ice in a cooler for delivery to the laboratory. The organization of sample containers either by sample location or analyses may be appropriate. Glass containers should be protected against breakage during transport to the laboratory. Provisions should also be taken to minimize the possibility of samples freezing during transport.

Chain-of-Custody Control

A record of sample possession from "cradle to grave" is kept in project files. The sample tracking starts with the sample container label. Information provided on the sample label should be complete and accurate. A copy of the chain-of-custody/sample-analysis-request forms should accompany each batch of sample containers from project site to the laboratory.

Sample Label

The information which should appear on the sample container label includes:

1. Sample identification number _____
2. Project number _____
3. Place of collection _____
4. Date and time of collection _____
5. Personnel collecting the sample _____
6. Preservative _____

Chain-of-Custody/Sample Analysis Request Forms

All samples are accompanied by chain-of-custody/ sample-analysis-request forms (Figure 1 or equivalent). The sampling supervisor is to keep a copy of this form.

Samples are ideally sent to the laboratory on the day of sampling. The laboratory is called at the time of shipment and informed of carrier, arrival time, and location.

Custody Seal

When the samples leave custody, the shipping container is sealed with a custody seal to ensure that the samples have not been disturbed during transportation to the laboratory. The personnel receiving the coolers are to note the condition of the seal and the sample containers within.

If the client prefers, individual sample containers can be provided with custody seals prior to placement in the shipping container for added assurance of sample integrity.

Analytical Methods

The sampling supervisor, in conjunction with the laboratory, will select the appropriate methods based on relevant regulations and guidance, desired detection limits, and laboratory capability. Analytical methods may be selected from "Standard Methods for the Examination of Water and Wastewater," SW-846, "Methods for Chemical Analysis of Water and Wastes" (EPA-60-4-79-020), as well as various American Society of Testing and Measurements (ASTM) procedures. When situations are encountered where the above methodologies are not applicable, methods will be selected which reflect industry standard procedures. In some instances, redundant methodologies (e.g., oil and grease and total petroleum hydrocarbons) may be appropriate. These decisions should be made in consultation with the sampling supervisor, the client, and, if appropriate, governmental agencies.

Field QA/QC Procedures

The procedures outlined below are followed by field team members to ensure the collection of reliable data during the ground-water monitoring event. The various samples which can be prepared and submitted for QA/QC analysis in addition to the well samples are also described.

Potential Contamination from Ground Surface Contaminants

During evacuation and sampling of ground-water monitoring wells, certain measures are employed to reduce the potential for ground surface contamination of sampling equipment. A dedicated plastic apron is placed around the casing and the immediate area to reduce the chance of sampling equipment contacting the ground surface. Care is taken to prevent contact of ropes and tubing with the ground. In the event that equipment must be laid down, the apron provides a contaminant-free area.

Field Observations

Field observations are critical in the verification and interpretation of laboratory data. Field observations during well preparation and sampling are recorded in the field log book. The following observations should be noted in field books:

- Odor
- Color
- Amount and type of sediment
- Degassing
- Hydrocarbon film
- Approximate water level elevations during well preparation and sampling
- Approximate rate of recharge
- Volume of water evacuated
- pH
- Specific conductance
- Temperature
- Miscellaneous conditions which the sampler finds noteworthy

All field monitoring equipment is calibrated daily according to procedures outlined in SW-846. The specific conductance meter is checked with a standardized solution before each sampling trip. The pH meter is calibrated with two buffers at the beginning of each day and checked with two buffers periodically during the day. Additionally, the

calibration is checked with a single buffer before each measurement.

Water chemistry field parameters are measured in a dedicated container. For specific conductance measurements, the glass probe must be used when there is organic contamination. The other probes can be used if no organic contamination is present.

Blanks, Spikes, and Duplicate Samples

The integrity of the samples are ensured by preparing one or more of the following quality control samples (if necessary). The QA/QC samples and frequencies described below are consistent with the TEGD and SW-846, which are guidance documents for RCRA projects:

1. Trip Blank - Fill one of each type of sample bottle with an organic or aqueous solution free of any analytes of interest, transport to the site, handle like a sample and return to the laboratory for the same analyses as the environmental samples. This sample set remains sealed until analysis. One trip blank is recommended per sampling event or with each analytical batch, with a minimum of one per 20 samples.

2. Equipment Blank - To ensure decontamination is properly executed, an aqueous or organic solution free of any analytes of interest is poured through the sampling equipment, transferred to sample bottles and sent to the laboratory for analysis. One equipment blank is recommended for each type of sampling equipment employed or with each analytical batch, with a minimum of one per 20 samples.

3. Blind Duplicate - To ensure contract laboratory accuracy, two separate samples are collected in the field from the same source at the same time. One sample set is labelled with the monitoring well's nomenclature and one set is labelled with alternate nomenclature. One blind duplicate is run/recommended every day or with each analytical batch, with a minimum of one per 20 samples.

4. Field Blank - To ensure reagent integrity and check environmental contamination, an aqueous or organic solution free of any analytes of interest is transported to the field, transferred to the

sample containers, and preserved. One field blank is recommended per analytical batch with a minimum of one per 20 samples.

5. Field Spikes - Field spikes are not required in SW-846 or TEGD, but can be prepared at the client's discretion. Field spikes are the most difficult QA/QC samples to prepare, but offer more information in return. Field spikes can:

   a. Check on the accuracy of laboratory quantitation;

   b. Check on the efficiency of extraction procedures and recoveries; and

   c. Prevent laboratory personnel from becoming complacent.

   A special type of field spike, called a matrix spike, can give the information cited above as well as:

   a. Provide an indication of the severity of matrix interferences; and

   b. Indicate the presence of co-eluting components which may otherwise be misidentified.

   Field spikes for the appropriate constituents should be prepared so that the resultant concentration is 10 times the PQL.

Decontamination Procedures Between Wells

Anytime monitoring equipment is transferred from one well to another, the following decontamination procedures will be followed:

1. Wash in an organic detergent/solvent with vigorous brushing inside and out. Remove the check valves on bailers to ensure total decontamination.

2. Wash with a pressurized spray of tap water or rinse in a dedicated container of tap water.

3. Rinse in two separate dedicated containers of distilled water.

4. Repeat the process if the bailer feels greasy, has particulate matter attached to it, or is stained.

Acceptable organic detergents and solvents are Simple Green, hexane, acetone, and methanol. Care must be taken that the cleaning agent does not contain constituents to be monitored in the samples.

Disposable items such as bailer rope and sampler's gloves are never transferred from one well to another. If any of the equipment cannot be decontaminated to the point it does not feel greasy, is stained, or has particulate matter attached, it should be discarded.

Laboratory QA/QC Procedures

The QA/QC program employed by the contract laboratory will be evaluated by the sampling supervisor to ensure the quality of analytical data generated. The guidelines used will depend on project needs and client direction, but will generally follow SW-846 or TEGD protocol if appropriate. The use of sufficient blanks, duplicates, and spike samples to detect erosion in the quality of analytical data will be employed as determined necessary. In all cases, it must be remembered that the analytical data could be involved in litigation. If the quality of the analytical data cannot be defended, the data will most likely be inadmissible as evidence. Specific guidelines which will be followed by the laboratory are:

1. Holding Times - Samples will be analyzed within a time period beginning on the day the sample was collected and specific to the type of analysis performed. Holding times should be consistent with Table 2-20 of the 3rd Edition of SW-846 (Revision 1, December 1987). It is the responsibility of the laboratory to meet these time constraints.

2. Reagent Blanks - Reagent blanks will be run periodically with samples in order to detect contamination within the laboratory. These blanks will be prepared and analyzed in accordance with the laboratory standard operating procedures (SOPs).

3. Surrogate Compounds - To determine whether lab instrumentation is detecting compounds present and accurately determining their concentrations,

surrogate compounds are added to the samples in known concentrations. The reported concentrations of the surrogates must be within certain limits set by the EPA. The procedures and control limits will be specified in the laboratory SOPs.

4. Duplicate Samples - If determined necessary, duplicate samples will be collected for 5% of the water samples, and sent to a separate laboratory as a laboratory QA check. Samples to be duplicated will be chosen randomly. The samples and the duplicate sample will be analyzed for the same parameters by the same methods.

Audit Procedures

The sampling supervisor will monitor and audit the performance of the QA procedures outline in this plan. The sampling supervisor will conduct field and office audits which will ensure that the activities are being performed as described in the plan. This ensures that the information being gathered is reliable and of good quality.

Field Audits

The sampling supervisor will schedule audits of field activities at various times to evaluate the execution of sample identification, sample control, chain-of-custody (COC) procedures, field documentation, instrument calibration and field measurement and sampling operations. The evaluation is based on the extent to which the applicable field procedures and QA/QC procedures are being followed.

Field documents pertaining to sample identification and control will be examined for completeness and accuracy. Field notebooks and field data forms will be reviewed to see that all entries are dated and signed and the contents are legible and contain accurate and inclusive documentation of project activities. The field documents shall be written in indelible material or xerox-copied to create a permanent record.

The auditor will also check to see that COC procedures are being followed and that samples are being kept in custody at all time and are in sealed containers or a secure area to prevent tampering.

Sampling operations will be evaluated to determine if they are performed as stated in this plan. The auditor will perform spot checks to determine that the appropriate number of samples are being collected, samples are placed in proper containers, and proper preservations, packaging, and shipment protocols are being followed.

Field measurement activities will be evaluated to determine if they are performed according to QA/QC guidelines. The auditor will spot check documentation for various instruments to ensure that calibration requirements are met. In addition, spot checks of the techniques used by field personnel with these instruments will be performed to ensure that data are being collected adequately.

Office Audits

The project director will review product quality and will see that the project is performed in accordance with approved quality assurance procedures. Prior to the production of the draft document, all work products will undergo review by project staff from the technical disciplines involved in the work. This will include review of calculations, test analyses, field measurements, graphs, tables, computer inputs-outputs, all modeling data and modeling reports and any document which involves generating information from the field data.

Laboratory Audits

Laboratory audits will be performed as necessary.

Post-Field Activities

The sampling supervisor and field team members are responsible for several activities after the samples have been shipped to the laboratory. The post-field responsibilities include laboratory contact, record filing, and equipment checks.

Continued Supervision

The sampling supervisor should call the laboratory on the day the samples are due to arrive at the laboratory to ensure that they have in fact arrived. The sampling supervisor should call the laboratory periodically to make sure that samples are being analyzed within the holding times listed in Table 2-16 of the 3rd Ed. of SW-846.

Records

The sampling supervisor collects all pertinent field data (i.e., well development, chain-of-custody, analytical parameters, copies of field log book, etc.) and files it in the client job file immediately after returning from the field to aid in reviewing analytical laboratory data. The sampling supervisor also makes sure laboratory data are properly filed.

Equipment

Any equipment problems noted during sampling and not corrected in the field should be corrected upon return to the office. Broken or contaminated equipment cannot be returned to storage.

Deviations from Sample Collection Procedures

The field sampling procedures listed above have been applied during the collection of thousands of ground-water samples and found to provide reliable data. However, the key to successful field work is to expect the unexpected. This manual cannot address every situation that may occur.

Experienced chemists supervise the collection of ground-water samples, and are relied on to identify and interpret critical situations in the field and to modify sampling procedures accordingly. Any deviations from the procedures outlined in this manual must be cleared with the client and noted in writing in the field log book.

CHAIN-OF-CUSTODY RECORD

Page _____ of _____

Project No.:	Today's Date:	Date Results Requested:	Analyses Requested
Sampler's Name:	Phone No.: 307-745-7474	Fax No.: 307-745-7729	
Company Name and Address: TriHydro Corporation 920 Sheridan Laramie, WY 82070	Company Contact:		

Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers	Analyses Requested

Remarks:

Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:

Were samples received in good condition?	Remarks:

FIGURE 1 : CHAIN-OF-CUSTODY / SAMPLE ANALYSIS REQUEST FORM

APPENDIX G

CLOSURE COST ESTIMATES

Closure Cost Estimate Worksheet, S-K Service Center, Mokena, Illinois (10/92).

Phase/Activity	Unit Cost	Unit	# Units	Cost
1. CLOSURE PLAN AND WORK SPECIFICATIONS				
Activity 1.1 - Compile Pertinent Information (Completed)	$0.00	N/A	0	$0.00
Activity 1.2 - Prepare Closure Plan/Health and Safety Plan (Completed)	$0.00	N/A	0	$0.00
Activity 1.3 - Submit Closure Plan to IEPA (Completed)	$0.00	N/A	0	$0.00
Activity 1.4 - Finalize Plan and Specifications	$40.00	/manhour	40	$1,600.00
Activity 1.5 - Select UST Removal/Remediation Contractor				
- Labor (Prep. bid package, send out, review, etc.)	$40.00	/manhour	20	$800.00
Subtotal Phase 1				$2,400.00
2. DRUM STORAGE AREA CLOSURE				
Activity 2.1 - Clean Floor of Designated Area				
- Labor for decontamination	$20.00	/crewhour	10	$200.00
- Hydroblasting equipment	$400.00	/day	1	$400.00
Activity 2.2 - Analyze Rinsate to Document Clean Closure				
- Labor	$20.00	/manhour	2	$40.00
- Laboratory	$600.00	/sample	1	$600.00
Activity 2.3 - Manage Wastewater Appropriately				
- Labor to containerize for shipment to TSD facility	$20.00	/crewhour	3	$60.00
- Transport Wastes (300 miles @ $2.50/mile)	$2.50	/mile	300	$750.00
- Treatment/Disposal	$0.50	/gal	300	$150.00
Activity 2.4 - Sample and Analyze Underlying Soils				
- Labor to collect samples	$40.00	/manhour	16	$640.00
- Electric drilling equipment	$100.00	/day	2	$200.00
- Laboratory (Min.Sp., VOCs, SVOCs, Met)	$790.00	/sample	4	$3,160.00
Activity 2.5 - Remediation of Subsurface Degradation	$0.00	N/A		$0.00
- See Phase 5				
Subtotal Phase 2				$6,200.00
3. UST DECONTAMINATION AND REMOVAL				
Activity 3.1 - Coordinate with Contractors and Officials	$40.00	/manhour	10	$400.00
Activity 3.2 - Implement Health and Safety Procedures				
- Labor	$40.00	/manhour	40	$1,600.00
- Instrumentation	$30.00	/day	5	$150.00
Activity 3.3 - Pre-Excavation Soil Sampling				
- Labor to collect samples	$40.00	/manhour	8	$320.00
- Laboratory analysis (Min.Sp., VOCs, SVOCs, Met.)	$790.00	/sample	4	$3,160.00
- Laboratory analysis (Disposal/Trmt. Charact.)	$2,100.00	/sample	1	$2,100.00
Activity 3.4 - Remove Product, Wastes and Sludges				
- Labor and vacuum truck	$75.00	/hour	12	$900.00
- Transport Wastes (100 miles @ $2.50/mile)	$2.50	/mile	100	$250.00
- Treatment/Disposal	$0.50	/gal	300	$150.00
Activity 3.5 - Dismantle and Remove Return/Fill Station				
- Labor for decontamination	$20.00	/crewhour	8	$160.00
- Hydroblasting equipment/labor	$400.00	/day	1	$400.00
- Transport Wastes (100 miles @ $2.50/mile)	$2.50	/mile	100	$250.00
- Treatment/Disposal	$0.50	/gal	100	$50.00
Activity 3.6 - Decontaminate UST Systems				
- Uncover Tanks				
o Labor/equipment to remove concrete and rubble (25 yds)	$200.00	/hour	10	$2,000.00
o Labor/equipment to remove cover soils (70 yds)	$200.00	/hour	4	$800.00
o Disposal of concrete and rubble (included under 3.8)	$0.00	N/A	0	$0.00

Closure Cost Estimate Worksheet, S-K Service Center, Mokena, Illinois (10/92).

Phase/Activity	Unit Cost	Unit	# Units	Co
- Open Tanks				
o Evacuate vapors (180 pounds of dry ice)	$1.00	/lb	180	$180.00
o Cut opening in tank	$100.00	tank	2	$200.00
- Clean Tanks and Appurtenances				
o Hydroblasting equipment/labor	$400.00	/day	1.5	$600.00
o Labor to squegee and scrape tanks	$20.00	/crewhour	10.0	$200.00
o Transport Wastes (100 miles @ $2.50/mile)	$2.50	/mile	100	$250.00
o Treatment/Disposal	$0.50	/gal	300	$150.00
Activity 3.7 - Excavate and Remove UST Systems				
- Disconnect/remove piping and appurtenant equipment	$20.00	/crewhour	10	$200.00
- Remove tanks	$400.00	/tank	2	$800.00
- Scrap tanks and equipment	$300.00	/tank	2	$600.00
Activity 3.8 - Handle Excavated Soils				
- Stockpile soils (labor and equipment)	$125.00	/hour	10	$1,250.00
- Sample and analyze stockpiled soils	$790.00	/sample	3	$2,370.00
- Transport non-hazardous degraded soils and rubble	$21.00	/yard	95	$1,995.00
- Disposal of non-hazardous degraded soils and rubble	$50.00	/yard	95	$4,750.00
Activity 3.9 - Sample and Analyze Excavation Soils				
- Labor to collect samples	$40.00	/manhour	4	$160.00
- Laboratory analysis (MS, VOCs, Metals)	$370.00	/sample	7	$2,590.00
Activity 3.10 - Fill, Compact and Refinish Excavation				
- Import soil for backfilling	$10.00	/yard	200	$2,000.00
- Backfill, compact and regrade excavation	$2,000.00	lump sum	1	$2,000.00
- Install concrete cover	$3.00	/sq. ft.	1000	$3,000.00
Activity 3.11 - Documentation and Progress Report				
- Labor to prepare closure progress report	$40.00	/manhour	40	$1,600.00
Subtotal Phase 3				$37,585.00
4. SITE ASSESSMENT				
Activity 4.1 - Conduct Soil Gas Survey				
- Labor	$40.00	/manhour	20	$800.00
- Instrumentation (PID)	$2.00	/msrmt	50	$100.00
- Instrumentation (Field GC)	$300.00	/day	1	$300.00
Activity 4.2 - Conduct Soil Boring Program				
- Labor for field activities	$40.00	/manhour	30	$1,200.00
- Drilling equipment/crew	$110.00	/hour	30	$3,300.00
- Instrumentation (PID)	$2.00	/msrmt	100	$200.00
- Laboratory analysis (MS, VOCs, Metals)	$370.00	/sample	16	$5,920.00
- Laboratory analysis (Background metals)	$60.00	/sample	4	$240.00
Activity 4.3 - Conduct Ground-Water Monitoring				
- Labor for field activities	$40.00	/manhour	20	$800.00
- Drilling equipment/crew	$110.00	/hour	20	$2,200.00
- Well materials	$400.00	/well	4	$1,600.00
- Laboratory analysis (MS, VOCs, Metals)	$370.00	/sample	4	$1,480.00
Activity 4.4 - Site Assessment Report				
- Labor for reporting	$40.00	/manhour	40	$1,600.00
Subtotal Phase 4				$19,740.00
5. IMPLEMENT REMEDIAL ACTION				
Activity 5.1 - Develop Remedial Action Plan				
- Labor for design and plan preparation	$40.00	/manhour	20	$800.
Activity 5.2 - Implement Remedial Action				
- Labor for supervision	$40.00	/manhour	20	$800.00
- Labor/equipment to remove 100 yd3 soil	$200.00	/hour	20	$4,000.00
- Transport/dispose degraded soils	$71.00	/yd	100	$7,100.00

Closure Cost Estimate Worksheet, S-K Service Center, Mokena, Illinois (10/92).

Phase/Activity	Unit Cost	Unit	# Units	Cost
- Backfill and compact excavation	$15.00	/yd	100	$1,500.00
- Repave excavation	$3.00	/sq. ft.	300	$900.00
Activity 5.3 - Monitor Remediation Progress				
- Labor to sample soils	$40.00	/manhour	10	$400.00
- Laboratory analysis (Min.Sp., VOCs, Metals)	$370.00	/sample	8	$2,960.00
Activity 5.4 - Prepare Remediation Progress Report				
- Labor to prepare progress report	$40.00	/manhour	20	$800.00
Subtotal Phase 5				$19,260.00
6. CLOSURE CERTIFICATION REPORT				
Activity 6.1 - Compile and Evaluate Data				
- Labor	$40.00	/manhour	20	$800.00
Activity 6.2 - Prepare Closure Certification Report				
- Labor	$40.00	/manhour	40	$1,600.00
Subtotal Phase 6				$2,400.00

Cost Estimate Summary	
Phase 1: Closure Plan and Work Specifications	$2,400.00
Phase 2: Drum Storage Area Closure	$6,200.00
Phase 3: UST System Decontamination and Removal	$37,585.00
Phase 4: Site Assessment	$19,740.00
Phase 5: Implment Remedial Action	$19,260.00
Phase 6: Closure Certification Report	$2,400.00
Total Cost Estimate	$87,585.00